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NEWSPAPER

NEWS IN BRIEF

Software Exemption Now Law in Calif.

SACRAMENTO, Calif. — A bill which exempts from taxation all software except that sold with a computer has been signed into law by Governor Ronald Reagan.

The exemption is for this year and next year and is intended to give the state time to arrive at a sound basis for assessing all software.

A state group of assessors has been studying ways to define and assess software.

The bill was an on-again, off-again measure that had been sent to the governor once before but was withdrawn for revision. A Senate amendment could have brought the state a loss of about $15 million because of taxes now collected on bundled software.

The original bill, which would have exempted all software, was amended to let stand the tax on bundled software.

County Supervisor Is Sued Over Use of DP Mail Lists

SANTA ANA, Calif — An Orange County supervisor faces a challenge in court over his alleged misuse of county computer data services in his reelection campaign.

The Orange County Employees Association (Ocea) has filed suit in Orange County Superior Court against supervisor Robert Battin, saying he misused public funds in requisitioning a mailing list of county employees.

Battin allegedly used the computer printouts of names and addresses for his political campaign.

At first he was refused lists of the names and addresses of members of the Ocea, it was reported, but then he requisitioned the computer tapes with the information on them for what he claimed was a proper, official use.

The use was said to be for the correction of "false and malicious misrepresentations of acts of the board of supervisors."

On the Inside This Week

CW Photos by E. Drake Lundell Jr.

Programmer Dick Clark sweeps mud from the Jackson Manufacturing Co. DP center in Harrisburg, Pa. High water mark near the ceiling can be seen on the wall behind the NCR Century 100.

Big Cleanup Begins After Agnes Cripples DP Centers in 5 States

By E. Drake Lundell Jr
of the CW Staff

HARRISBURG, Pa. — Hundreds of computer systems were buried under tons of water and mud last week as floods spawned by tropical storm Agnes inundated the Middle Atlantic section of the country, killing over 100 people and leaving thousands homeless.

Even computers that escaped the worst flooding in this century felt the effects of the storm as brownouts, blackouts and power surges swept up and down the East Coast.

In the mammoth cleanup job that began last week, DP managers here and in other hard-hit sections were making plans to install new systems and trying to retrieve lost files by any means available, including drying out the millions of waterlogged punched cards and cleaning out mud-coated disk packs and tapes.

All of the users here interviewed by *Computerworld* were impressed with the aid they were getting from vendors, either in supplying new systems quickly or finding spare machine time for their use.

"NCR didn't even call us," one Century 100 user said. "They knew where we were and that we would need help. The first thing I heard from them was that a new system was on the way and would be in Friday or Saturday — just a week after the worst of the flood."

In addition, it was known that IBM was shipping in several systems to the area, as were other mainframe manufacturers, and that Univac had replaced 43 keypunches by Tuesday here — just two working days after the damage.

While the full extent of destruction

(Continued on Page 2)

The View From There

Mud, Dust and Weariness

By E. Drake Lundell Jr.
of the CW Staff

Dave, a programmer, was going home for the first time after six days as a refugee in Wilkes Barre, Pa.

Sitting in the back of a National Guard truck, rolling past stores that appeared to have been bombed in the center section of this city, his jeans and boots mud-crusted, he wearily recalled: "The water was just about to get into the second floor of my house when we got out by boat. I don't know what I'll find, but I know it's bad. The whole town is."

What about the computer center where he works? "I think it's all right, but I'm just worried about my house."

* * *

"I knew the disaster was coming for the first time on the 11 o'clock news on Thursday when the weather report forecast of the flood's crest seemed to be revised drastically upwards," Tod Spare, a Harrisburg DP manager, recalled.

"When I realized that the center was under eight feet of water, I didn't know whether to quit my job or go on."

He spent last week hosing down a 360/20 and related equipment and pushing the mud out of the center "before the smell got too bad."

* * *

Wednesday, six days after the flood started, the mud still clung to the Century 100, making it look like a swamp creature.

The sun had not yet reached into the damp computer room and the swampy smell of mud and overflowed sewers was

(Continued on Page 2)

Robert Allahouse, secretary-treasurer at the Jackson Manufacturing Co., Harrisburg, clutches one of the 40 disk packs he waded through waist-deep water to save.

Crippled DP Centers Mop Up

(Continued from Page 1)

cannot now be assessed, some estimates can be seen in a rough breakdown in this city alone.

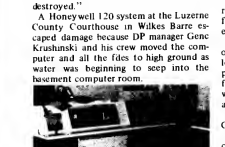
"Several" IBM Model 20s were damaged along with 12 System 3s; 43 Univac keypunches were under water and mud with at least one 9300 and one 1108 computer system; at least two NCR Century 100s were damaged and several other systems felt the flood's fury.

Strangely, however, there was less damage to computer systems in Wilkes Barre, Pa., the city that perhaps had more flood-related damage than any other.

In a survey of computer centers in the flood area there, seven of the users contacted had their centers on upper floors and therefore escaped the water's impact.

However, at least two systems were still under water at the end of last week and at least one NCR Century was "totally destroyed."

A Honeywell 120 system at the Luzerne County Courthouse in Wilkes Barre escaped damage because DP manager Gene Krushinski and his crew moved the computer and all the files to high ground as water was beginning to seep into the basement computer room.



John Conville, customer engineer with Univac, tries to assess the damage to a 9300-I system at Pennsy Supply Co. in Harrisburg.

COMPUTERWORLD
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The problems in Harrisburg were compounded by some inaccurate estimates of the flood's destruction.

"When I went home on Thursday night," Tod Spare, manager for Computer Utilities of the North East, said, "they were predicting a crest of 22 feet, which would have brought the water to our front yard, but not into the budding.

"Nevertheless, we moved some equipment off the floor, just in case."

"But," he added, "the flood crested at least 12 feet higher than that estimate. If I had known, I probably would have taken the files for my card decks out of the budding and saved them at least."

But the firm lost more than 500,000 cards and a 360/20 when the water rose to six feet in the computer room. Among the cards lost were those containing the only complete copy of 50,000 customer records for a local dairy.

The firm is now trying to bring the records up to date from outdated manual files, but may never be able to get the entire file restored.

Spare, however, was able to get back in operation with only two working days lost because he kept a duplicate set of his program decks on "high ground" and he found another Model 20 in the area that was not damaged and that had some time available.

The center at Jackson Manufacturing Co. up the street was not as lucky.

"I don't see how we can get back in operation for at least one or two months, even though NCR is already shipping us another Century 100," said Treasurer Robert Allahouse.

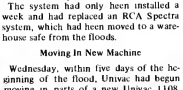
But Allahouse was able to save most of the firm's records from water damage. When he heard the flood crest was going to be a lot higher than first reported, he returned to the center and carried about 40 disk packs out to his car through waist-deep water between the DP center and the nearest high ground.

At the Pennsylvania Bureau of Management Information Systems in Middletown, a $2.5 million Univac 1108 was drowned in water that rose to around six feet in the computer room.

The system had only been installed a week and had replaced an RCA Spectra system, which had been moved to a warehouse safe from the floods.

Moving In New Machine

Wednesday, within five days of the beginning of the flood, Univac had begun moving in parts of a new Univac 1108,



Swollen cards buckle drawers.

which bureau personnel said would be installed at a location "on higher ground."

A Univac customer engineer, working on a 9300-I system, flooded out at Pennsy Supply Co. in downtown Harrisburg, said he didn't think any of the system could be saved except for the "skin."

"The logic cards are already starting to oxidate," he said, "and it would be impossible to clean out the mud around the wiring without using pressure water which would probably knock all of the wiring loose."

At the same time, a new 9300 was already on its way to replace the flood-soaked system.

In Wilkes Barre, the list of companies lucky enough to have their equipment located on top floors of buildings was impressive.

Blue Cross of North East Pennsylvania had its first floor completely wiped out,

CW Photos by E. Drake Lundell Jr.

Over 500,000 punched cards had to be thrown out at Computer Utilities of the North East, a 360/20 user in Harrisburg which was inundated by six feet of water.

but the computer system – an IBM 360/40 – was on the 8th floor; the First National Bank with four Burroughs B270s, one B300 and a B3500 had its computer center on the 4th floor; Fowler, Dick and Walter, a department store with an IBM 360/20, located DP on the 5th floor, and King's College, with an IBM 1620 and Honeywell 115, had its center on the 4th floor.

Mercy Hospital, with a Century 100, was not so lucky and "it will probably be months before we are in operation again," according to David Jordan, DP manager.

Cards and other litter rest in mud behind NCR Century 100 at Mercy Hospital in Wilkes Barre.

Not only was the system knocked out, but "there may have been structural damage to the old wing of the hospital where the DP center is located," he said.

Even though many of the computer users in Wilkes Barre were lucky in the location of their systems, the systems were still out of operation at the end of last week, since power had not been restored to the downtown area and wasn't likely to be restored soon.

The local power company is requiring that all electrical connections be completely washed and dried and in some cases replaced before it will restore power to buildings affected by the floods. A complete inspection will also be mandatory before power comes back on.

And while Pennsylvania's towns of Harrisburg and Wilkes Barre were some of the hardest hit by the floods, the damage extended up and down the East Coast, from Richmond, Va., through Baltimore, Md., to the central part of New York State.

The staff at a Martin Marietta center in Towson, Md., spent last week trying to dry out an Electronic Memories and Magnetics add-on memory box connected to a 360/30.

Across town at Sparrows Point, Md., Bethlehem Steel DP personnel breathed a sigh of relief on finding their center had not been flooded out, but found they were without power for several days.

But even as the waters receded, new problems arose, with dust, stirred up by National Guard vehicles roaring by on the dried-out, mud-choked streets, getting into everything and compounding cleaning problems for flooded-out centers and their more fortunate neighbors alike.

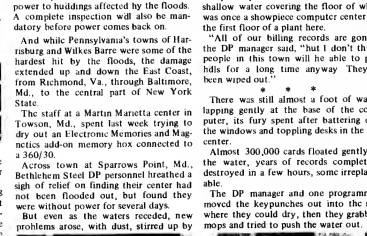
The complete flood damage won't be in for weeks, possibly months, but millions of dollars worth of equipment were lost to the ravages of the storm and it appears unlikely that much of it can be saved.

The destruction to records and files is much more serious, however. The entire billing records for one hospital and the inventory and billing and payroll records at a manufacturing plant are lost; and accounts receivable and payroll records may be gone forever at another manufacturer.

"Since I rent my system," one DP manager said, "the lost equipment is basically the problem of the manufacturer. But where can I replace all the cards that were wiped out by the flood? They contained my firm's entire financial records."

What lessons were learned?

"Duplicate everything and keep the duplicates on high ground," Tod Spare said, echoing the thoughts of most DP men in the area.



This equipment was saved because Luzerne County DP Manager Gene Kuchinski and several programmers lifted the Honeywell 120 system out of the basement DP center and into the lobby of the Luzerne County Court House, which was above the high water mark in Wilkes Barre.

Mud...Weariness

(Continued from Page 1)

overpowering.

"When that window went, it let in everything," a programmer said, pointing to branches, sticks and even driftwood that littered the floor and piled on top of the computer. "I don't think anything can be saved."

* * *

The soggy mass of paper that was once a computer printout still sat in mud and shallow water covering the floor of what was once a showpiece computer center on the first floor of a plant here.

"All of our billing records are gone," the DP manager said, "but I don't think people in this town will be able to pay bills for a long time anyway. They've been wiped out."

* * *

There was still almost a foot of water lapping gently at the base of the computer, its fury spent after battering out the windows and toppling desks in the DP center.

Almost 300,000 cards floated gently in the water, years of records completely destroyed in a few hours, some irreplaceable.

The DP manager and one programmer moved the keypunches out into the sun where they could dry, then they grabbed mops and tried to push the water out.

Probst Cites CAI, Business Data Needs

By Edward J. Bride
Of the CW Staff

NEW YORK – Computer users must direct their technical efforts to improving education for the young, and to analyzing "external" data for corporate stability, Univac President Gerald G. Probst said here last week.

The spread of computer-assisted instruction (CAI) could build "better citizens, better leaders, a better labor force," Probst stated.

"By creating a better educational environment," he continued, "you help strengthen the social and economic health of the nation and of the world."

Probst was keynote speaker for the 22nd annual conference of the Data Processing Management Association (DPMA).

Probst told the estimated 1,000 attendees at the general session that "push-button swiftness" in accounting and financial statistics is no longer adequate, despite its strengthening of companies' internal operations.

Nor is it adequate for corporate purposes, he continued, to simply use the computer for development, manufacturing or marketing applications, even though these functions have been coordinated in the typical company into a "cohesive well-directed effort."

"Now, however, in the 1970s, you will have to cope with whole new areas of vital information," Probst added. "Raw, unrefined, less tangible information that you never before had to concern yourself with," but which is needed by top management for decision-making, must be analyzed by data processing departments.

External forces, "political, social and technological" in nature, influence the development and growth of companies and entire industries, Probst explained, while noting these "forces . . . must be understood by top managements to help them rapidly make critical decisions in this high-speed, 'instant everything' world we live in."

"The need for instant external information together with the internal information" compounds the "perplexities of the decision-making processes," he added.

To illustrate, Probst suggested that businesses should have been able to predict the 1969-71 recession by analyzing the external "tell-tale signs" that were "almost completely obscured by the economic euphoria of the times."

If computer users in the mid-60s "had reached out to harness the available external information in concert with our internal marketing, manufacturing and financial information," then processed the external data, and then "related it to the plans and strategies" being developed, "many of us could have weathered the storm far better than we did."

CW Photos by Edward J. Bride

Probst

Future areas of study include the activities of environmentalists and conservationists, as they relate to corporate plans, the varied effects of import and export restrictions, and the impact of consumer protection agencies.

Corporations are now "more and more social individuals," the Univac president suggested, "and their profit-generating capacities are totally affected by countless external stimuli," such as consumer advocates and agencies.

Harnessing external information for business needs is only "half the job," he continued, observing that the computer is "already moving ahead in social areas . . . in education, health, in medicine, in law enforcement, in welfare."

Since the 1970s will see "a great deal of additional demands laid on the company's role in society," he said, computers must now be turned "toward satisfying identifiable needs in the external world."

Computer professionals worked "too rapidly" in developing CAI in the 60s, he said, and they neglected "the expertise of educators who knew full well the basic needs for individual instruction" tailored to individual learning methods.

"The result was that CAI lost much of its glamor over the years.

"But I can tell you here and now that CAI is far from dead," he reported.

The DPMA was an appropriate place to address the topic of education, he said, because members have "already performed remarkable feats for education and the promotion of education" through existing programs.

Among the few products introduced or shown in public for the first time was the Asciscope, the new CRT terminal introduced by ITT.

Randomex, Inc. President J.M. Ludlo shows his company's Model 235 disk pack cleaner to users.

Operator demonstrates the CRT console, part of the Cummins-Chicago Corp. 4400 unit.

Paper Producers Prominent at DPMA Exposition

NEW YORK – Paper has a big future in the computer community, if the exhibit hall of last week's conference of the Data Processing Management Association (DPMA) is any indication.

Almost one third of the 75 exhibitors showed envelopes, continuous forms, carbonless papers, bursters and other "ancillary" equipment, as one user observed.

Many other exhibitors showed supplies and accessories, including disk packs and cleaners, plus software, communications, security and educational products.

IBM Returns

IBM returned to the conference picture, showing a System 3 and related communications equipment, plus a System 7. Other companies with large-sized booths held preprogrammed presentations, without exhibiting the equipment itself.

Exhibitors were nearly unanimous in their enthusiasm for sales prospects, possibly because there was little individual competition. Exceptions were the forms, supplies and security areas.

Several companies showed card or other identifying systems for computer-room entry, and two companies had Halon fire extinguishing systems. Safety First Products Corp. had its DPMA debut with a Halon system, while other related products included fire detection and alarms, underground storage vaults and magnetic detection units.

ITT introduced a new low-cost CRT terminal, which leases for $65/mo, including maintenance but with no options. The unit includes a built-in acoustic coupler and modem, and is meant to replace teletypewriters and "more expensive CRT devices," the company noted.

Also shown for the first time was the Cummins-Chicago Corp. 4400, a peripheral processing system, with an optical and MICR scanner, tape drive, 2.5M byte disk and keyboard/CRT terminal.

General Instrument had a new System 75 for data entry, retrieval and display, and Computer-Link Corp. demonstrated its "unannounced" 3336 disk pack inspector. The unit is set for formal announcement and delivery later this year, a company official noted.

Cullinane Corp. also exhibited for the first time at a general trade show, abandoning its previous "vertical" orientation

30% Increase

The 75 exhibitors show an increase of about 30% over the past meeting in Houston, DPMA noted. About 1,800 people registered for the technical program, a slight increase from the Houston meeting, DPMA added.

Overall attendance figures for the exhibit area were not available, although early in the week DPMA officials said they "optimistically" hoped for 7,000 to 10,000. But midway through the conference, they lowered estimates to 5,000 to 7,000 which would represent only a slight upturn, despite the fact that the conference was held in what DPMA called the "world's highest concentration" of computer users, and despite the fact that exhibit attendance is open to the public.

Elliott Resigns From DPMA Post

By a CW Staff Writer

NEW YORK – R. Calvin Elliott, executive director of the Data Processing Management Association (DPMA) for the past 12 years, has resigned for "personal reasons."

No immediate successor was named, and Elliott said he planned an "extended vacation" before announcing further plans.

The resignation comes during continued internal problems that have plagued DPMA in recent months.

During last week's meeting, a "grass roots" movement to reduce central authority at international headquarters succeeded, with abolishment of the executive board of directors. More authority was given to regional vice-presidents, who are now members of an executive council.

The planning process for the 1972 conference was hit by controversy late last year, when headquarters stripped the local chapter of all authority in sponsoring the Conference and Business Exposition.

The annual meetings are normally "sponsored" by the local chapters where the events take place, but headquarters accused New York Chapter representatives of violating rules.

Brainy Operations Staffs Are an Asset: McFarlan

By Edward J. Bride
Of the CW Staff

CAMBRIDGE, Mass. – Successful computer users, those termed "most progressive" by Prof. Warren McFarlan, have reversed several management and personnel procedures over the last three years, especially in the operations area.

The Harvard University professor said that operations personnel, for example, are still considered "low level" in less effective organizations today.

In successful computer installations, "I find Ph.D's people with Masters' degrees, and others with college degrees" whose sole function is to use hardware and software monitors "to probe the situation" in the computer.

They are "measuring the computer in a way never measured five years ago," he said, adding the "most effective organizations" have this talent more often than not.

McFarlan made his remarks at the recent annual convention of the Society of Women Engineers (SWE).

Other changes McFarlan has observed in successful DP operations include a higher-level of console operators, and more organized planning staffs and procedures.

Ten years ago, he said, a high school graduate could provide "all the talent we could hope for," for console operators, and today, some companies are still trying to run third generation equipment with that kind of personnel.

Now, however, the more effective organizations have a "full career path" within operations and no longer have to promise console operators that some day they might "progress" to the systems or programming department.

Regarding planning, McFarlan said a firm process is needed because of four reasons:

- Rigid budget constraints on the typical DP operation.
- Systems and programming resources are "skill-limited," driving managers to "prioritize" on systems and applications.
- With hardware limitations, it is hard to "lend" the organization as "new projects are dreamed up."
- Manpower limitations keep the number of projects down.

McFarlan made his remarks during a luncheon meeting of this 22nd annual conference, the largest ever held, SWE officials noted. The 140 attendees came from all geographical regions of the society, and represented almost 20% of its 750 members.

In delivering the keynote address, Navy Cmdr. Grace Hopper continued to support the use of minicomputers as components of "systems of computers," rather than "computer systems."

Machines are not likely to continue decreasing in size, because of problems with heat dissipation, she noted. The answer is to have "parallel computers," either in one location, or serving as terminals in several locations.

Hopper also dispelled the belief that cost-per-transaction decreases as the machine's size increases; this may be true in the "number-crunching" applications, she expressed, but "not in data processing."

While the cost of computing has diminished in the past decade, this has not happened in software, said the Navy's chief of programming languages.

Furthermore, users are demanding more and more non-applications software with a system: security, data management, and operating systems, just to name three, she added.

She predicted that the "jet computer" would "probably be a system of minicomputers," using one standard data description language, plus standardized high-level languages.

Terminal World

In another session, IBM Systems Engineer Kathleen McClellan said the "technology is here" for a terminal-oriented world, including home terminals for instruction, shopping, and credit transactions.

"We definitely need laws" to control data banks, she suggested, since technology can be applied to provide vast amounts of information to anyone who wants it.

"It's not always certain," she commented, "that we know of all the data banks that have information on us."

CW Photos by Edward J. Bride

McClellan

Aiding this dissemination of information is the "current trend" in the computer industry which is heading toward direct user interface, machines understanding human languages (so less technical people can operate them), and terminals that will be portable, she said.

In the same vein, Irma Wyman of Honeywell observed that the users of computers, defined in this context as people who keep or access files on the public and not just on employees, are the people who must resolve the problem.

The industry devises techniques people will use, but the privacy and relevancy problems are in the "original applications design," she said.

Wyman

A third class of citizens, other than the industry or the user, is the "great American public," which must apply pressure on the other classes if the privacy problem is to be solved, she said.

Guide 'Tradition' Upheld

MIAMI BEACH, Fla. – That famous – or infamous – departure from tradition, non-IBM software discussed at an official Guide meeting, never happened, attendees report.

Guide, a large-computer user group acknowledged, approved, recognized and partially sponsored by IBM, had planned to have a session on non-IBM software at a recent meeting here.

Conference attendees were told by officials that such presentations were not within the intended framework of the Guide organization, and the session was canceled.

Insurance Program Recovering

COLUMBUS, Ohio – A computer program in the Medicare division of the Nationwide Insurance Co. here was having some ills of its own recently.

Tha computar which processes Madicara claims was rajecting a number of legitimate claims – at the rate of about 250 for every 25,000 claims submitted, according to William P. Harper, Medicara administrator for Nationwide. Although manual review of rejected bills is standard, many were slipping through, he said.

The problam, said Marvin Holt, claims manager, was in tha original programming. Certain checks were built into the program to spot unusual situations such as duplicate claims, or three surgeries on the same patient in ona day.

The "audit" program in error was checking for medical and surgical services for the same patient, sama day, *any* doctor, when it should have read *same* doctor, Holt axplained. He said it is unusual for a patient to see a doctor in his office (madical service) and have surgery the same day by that doctor.

Holt said tha programming was not totally at fault. Better manual review would have prevented many of the rajected claims from being returned. Tha claims dapartment has requested the necessary programming change and, in the meantime, is carefully checking every rejected bill, Holt added.

State Pushes Individualized ID Numbers For Identification of Stolen Property

By Edward J. Bride
Of the CW Staff

BOSTON – A new twist to exception reporting is helping police recover stolen property in Massachusetts, and a $1,000 tape recorder is among the first items to be restored to its rightful owner.

Under "Operation Identification," individuals are being asked to affix their driver's license number to any item that might be subject to burglary: TVs, stero players, even stoves and refrigerators.

In Massachusetts, the driver's license number is also the Social Security number, so most people can remember this new "property identification number," observers noted.

The program was initiated last March by the Massachusetts Association of Independent Insurance Agents and Brokers.

An official of the association commented that most people do not save bills of sale, warranties or other paperwork which might contain a serial number, so the Social Security number – "we prefer to say driver's license number" – is used.

Otherwise, the program resembles the FBI's system of recording tha serial number of stolen property in its National Crime Information Center.

Registry's Computer

The main difference is that tha ID numbers and the associated names and addresses are already on the computer at the Registry of Motor Vehicles, a CDC 3300 with 1.3 billion bytes of disk storage.

If a policeman suspects he has come across stolen property, he merely checks for an etched-on ID number, and calls any of several terminal locations: state police who can access the Registry's computer through their own state net, local police departments who have terminals to the state police net or any or the 34 branch offices of the Registry.

The Registry's computer gives the name and address which matches the driver's license number – there is no indication of whether the property is stolen. This is left to police judgment and investigation.

Several other states have similar systems, according to Peter McGlynn, of the insurance association.

The program could become nationwide, to recover property taken across state lines, if owners affix the state's abbreviation to the numerics of their license number, he noted.

Thus, Massachusetts owners would prefix the nationally recognized Zip Code letters "MA" to their number, he suggested. The plan is operational in Michigan, California, Arkansas, Louisana and other states, McGlynn said.

One feature of the program is its simplicity, McGlynn said. The FBI's data bank only works if people save the serial number of property, he indicated.

With the Social Security – or driver's license – number, the same number appears on all items and the number is individualized to a particular person, so it can be remembered, he noted.

If the Federal Government would approve use of Social Security numbers for other purposes, or if all states would adopt the SS number as the driver's license number, then the program could easily be extended, McGlynn commented.

Although the association inaugurated the program in March, announcement of the state's participation was withheld until delivery of the computer, and its debugging, was complete. A statewide public information campaign is now under way and is "going great guns," he said.

The "ironic" part about this campaign is its simplicity, he continued. A professional burglar may have some "pride" in breaking a sophisticated alarm system, but it is necessary to deface stolen property if the ID number is etched onto it.

Software Protection Advocated in Japan

TOKYO – Domestically-developed applications may be afforded legal protection comparable to patents and copyrights, if recommendations of a special committee of the Ministry of International Trade and Industry are followed.

The committee recommended legislation to form a system of registration and public announcements of software programs, plus related enforcement capabilities. It also suggested interim steps for registering software and certifying the programs according to application.

Lack of Protection

The Research Committee on Legal Protection of Computer Programs concluded that there is a complete lack of legal protection here for applications software, and said the recommended law should prohibit all infringement, including unauthorized copying and use of registered software.

The law would empower developers of software to demand a "legal halt" to infringement and to "demand compensations for damages inflicted," local sources said.

The Professional's Viewpoint

Readers Applaud Call for Complete Set of Standards

The news of the action of the Boston Chapter of the Society of Certified Data Processors in starting a program to define a complete set of the standards needed in practicing data processing [CW, The Taylor Report, June 21] was received with immediate enthusiasm, careful critiques, lists of areas omitted and offers help from many parts of the country.

The following replies are arranged in three categories. If you would like to help, or have more information about the progress, please write to the Professional Viewpoint Page, *c/o Computerworld*, 797 Washington St., Newton, Mass. 02160.

The Professional Viewpoint Page is prepared by the editors of *Computerworld*, in conjunction with the Society of Certified Data Processors.

Critiques Offered

Like Periodic Table

"It appears we are now very close to having completed the most significant accomplishment in the entire history of data processing – namely, a coherent system of standards.

It appears no less momentous than, for instance, the development of the periodic table of elements – once the table is invented, finding the unknown elements to fill in the empty spots is relatively easy.

"Much of the paraphernalia of an ongoing standards system is already in place: an enforcing organization (SCDP); certifiers of some of the third type of standards, such as the tape testing committee; and even proposed documents for the users to force the benefits of standards. Now the intellectual framework has been invented for all these other elements.

"It seems that what has been proposed is not three levels of standards, but rather three orthogonal dimensions on which all standards can be measured.

"The first dimension would be the characteristics. The first says that whatever is observed (the DP system) must be determinable or measurable. If a standard does not have this quality, it cannot meet any of the other requirements.

"The second characteristic is reproducibility, which allows for the enforcement of objectivity by a form of competition. These two, measurability and reproducibility are the basic assumptions upon which the scientific method is built. It is esthetically pleasing to find them at the cornerstone of a system of standards for data processing." – David L. Shuman, Purdue University, Ind.

Facts, Not Just Figures

"To minimize cost figures is not the same as to minimize unit costs. The first can be accomplished by overlooking, intentionally or unintentionally, significant cost elements, whereas the second is achieved by better management of resources." – Fred Brand, CDP, San Jose, Calif.

Priorities Needed

"All shown categories are duties. Some, such as expedient working, and minimization of unit cost figures, may be subject to higher priorities – such as protection and accurate presentation." – Mike Ingram, CDP, Pomona, N.J.

Rights or Responsibilities

"Giving warning of all knowable dangers is a must – and must be given to the customer. The list of specific standards should be available to users upon request. If not requested, the responsibility completely falls on users' shoulders." – H. Armstrong Jr., acting president, Society of Professional Data Processors, Syracuse, N.Y.

Missing Areas Noted

Many of the respondents were not satisfied that the 26 areas listed were really complete, and suggested their own additions. Probably owing to the lack of space on the form, generally only the main title was given. Among these additions are:

Instruction to Man

"Standards are needed to guide individuals within the field of data processing. More important to me, they are needed to provide non-data processing management with some means of knowing what to expect from data processing professionals.

"The list given appears to be aimed at the environment immediately associated with the equipment. Look at the 26 areas. Is there any specific mention of instruction to man for collection of information or for usage of information.

"Let us keep this effort going – but let's not forget the beginning and ending." – Cornelius M. Head, Indianapolis, Ind.

Other Areas

"How about hardware?" – Lowell Anderson, Wellesley, Mass.

"Where are system test standards?" – John Sincock, Baltimore, Md.

"No system design and interfacing?" – Walter G. Morton, Los Angeles, Calif.

"Management!" – Robert C. Gettys, Albuquerque, N.M.

"Program Verification?" – Len Angle, Pulaski, Va.

Help Offered

Offers of help in developing some or all of the standards came in from widely separated areas. These include, in alphabetical order by state:

"I'll work on programming standards." – Stan Sanford, Los Angeles, Calif.

"Application Programming Specs." – Eugene Bosofkin, Westport, Conn.

"Error Reporting & Analysis." – James Hammon, Ft. Walton Beach, Fla.

"Program Testing." – William Bell, CDP, East Point, Ga.

"Program Operation." – Don McKnight, CDP, Springfield, Ill.

"The Proposals." – Cornelius Head, Indianapolis, Ind.

"Any Area." – Virgil F. Basgall, Topeka, Ks.

"Program Documentation." – Lyall Spring, CDP, Metairie, La.

"Full Range." – Marvin Chaiken, CDP, Portland, Me.

"Proposal Evaluation." – J. Schneider, Rockville, Md.

"Operations." – L. Mazzarelle, Boston, Mass.

"Operations." – J.R. Robosan, Southfield, Miss.

"Data Input." – John Nugent, Minneapolis, Minn.

"Management." – Robert Gettys, Albuquerque, N.M.

"Operator Documentation." – Ed Fraum, New York, N.Y.

"Error Analysis & Reporting." – Elwood Walker, CDP, CPA, Winston-Salem, N.C.

"Requests for Proposals." – B.A. Reardon, Middletown, Ohio.

"Financial Auditor Facilities." – H. Hohenadel, CDP, CPA, Pittsburgh, Pa.

"Operator Qualifications." – R.E. Bierbaum, Texas City, Texas.

"Evaluation of Alternatives." – R.W. Pratt, CDP, Salt Lake City, Utah.

"Operating Systems." – David Fleer, CDP, McClean, Va.

"Any Area." – Jim Wiechers, Lake Mills, Wis.

Programming Overruns Blamed on Lack of Control

By Edward J. Bride
Of the CW Staff

TORONTO – There must be changes if programmer productivity is to increase, and Rudolph Hirsch has some ideas on maximizing performance.

Hirsch, manager of systems evaluation for the European operation of First National City Bank, blamed the lack of control and the failure to use standard management techniques for programming overruns.

Non-technical management "persists" in 1950 attitudes that hold the "unfamiliar" in awe, Hirsch suggested. He said it was "flattering to us but not justified" that management "frequently considers all of its programmers to be highly gifted and thus not manageable by conventional management tools."

Hirsch's ideas were presented in a paper delivered to the Association for Computing Machinery's Tenth Annual Conference of the Special Interest Group for Computer Personnel Research (SigCPR).

90% Fail

"A good 90%" of programming projects fail to meet time estimates, despite the fact that "an experienced programming manager can estimate to within about 10% the number of statements a program will contain when finished," he said.

The time estimates are "spectacularly unreliable," he added, one reason being the "almost irresistable desire of programmers to begin coding at the earliest possible moment." This "only too often" means before the specifications are "fully documented."

"Seat-of-the-pants" forecasting methods are another reason, according to the paper.

Finally, few installations have tried to install a system for "reporting and controlling programming projects as they proceed or to evaluate them when finished," Hirsch said.

"As a result, we generally don't know that a programming project is in trouble until a midcourse adjustment can no longer be made," he said.

Time Sheets, Reports

To change all this, Hirsch proposed requiring each programmer to turn in a "daily time sheet" to help overcome the "perennial difficulty in getting people to describe what they do, especially over any length of time."

If this information were only required weekly, he claimed, they would only have "vague" recollections about what they did, and the information would have "lost its value."

In order to obtain data on programmers' efficiency, computer-use by program must be obtained, he said; then, with per-hour programmer and computer costs a known factor, "machine-producing a project and program time and cost analysis report" is an "easy matter."

This also provides project status information which is "readily visible even to non-technical management," he wrote. The result is a "rigidly based evaluation" of each programmer, correlated against original estimates and the number of statements produced.

Increasing productivity can be encouraged through several management measures, he continued. They include:

- Fight boredom by "involving programmers in their applications, meeting their "customers" and becoming familiar with their operations.
- Monitor progress, with reports fed back to each programmer.
- Enforce customer discipline. While programmers may be guilty of procrastination on sign-offs, the customers "are no less guilty of the same sins." When a customer approval is due, he continued, a programmer will either wait for that approval, "or proceed on the assumption that an unqualified approval will ultimately arrive."
- Use on-line testing, since "a good deal of time is wasted in the testing process." On-line testing reduces or eliminates programmer idle time during turnaround differences between man and computer."
- Use specialized program keypunchers to avoid programmers punching their own programs, or to avoid the slow turnaround of having "data keypunchers" do the programs.
- Provide adequate working space.
- Rotate applications to reduce boredom. The precautions give the-side benefit of "insurance against the unpleasant consequences of personnel turnover," he said.
- Use new salary approaches and career paths. A productive programmer "may or may not turn out to be a good manager," he proposed, "but it is certain that, once a manager, he no longer programs." The solution is to pay him as a manager, Hirsch said.

CW's Inquiring Photographer Asks

Where Is Personnel Management Going?

TORONTO – When over 100 specialists or other persons concerned with computer personnel research gather for a technical meeting, a logical topic for discussion is personnel management.

Such was the case during the recent SigCPR conference.

Since discussions during the formal part of the conference were devoted to certification, unionization, salaries, career development and related topics, *Computerworld* asked users from the business community for their near-term projections and ideas on significant trends or developments in personnel management, anticipated for the next three to five years.

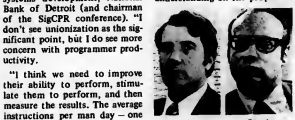
Fred A. Gluckson, director of systems development, National Bank of Detroit (and chairman of the SigCPR conference). "I don't see unionization as the significant point, but I do see more concern with programmer productivity.

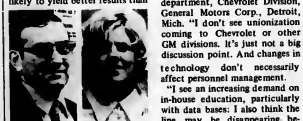
"I think we need to improve their ability to perform, stimulate them to perform, and then measure the results. The average instructions per man day – one way of measuring performance – are still alarmingly low, and that's where the frontier is."

W. Spicer Loving, administrative services director for MIS, the Kellwood Co., St. Louis, Mo. "People should be given all the responsibility they can handle within a certain job category.

"There is a movement toward expanding jobs vertically, and in terms of productivity, this is likely to yield better results than any other direction we could take. I disapprove of assembly line software; it does not coincide with the definite trend toward what is now being called job enrichment."

E.V. Halpern, education and training coordinator, management sciences department, international division, Mobil Oil Co., New York. "One of the greatest lacks is that of management understanding on the proper use of computer resources, including people, not just equipment. I believe in bringing high potential non-EDP people into EDP, and training them, as one step. Whatever we accomplish in personnel management will be composed of small steps; there is no magic wand. It's a slow process."


Loving Gluckson


Halpern Rugis

Sharon Rugis, coordinator of education, information systems department, Chevrolet Division, General Motors Corp., Detroit, Mich. "I don't see unionization coming to Chevrolet or other GM divisions. It's just not a big discussion point. And changes in technology don't necessarily affect personnel management.

"I see an increasing demand on in-house education, particularly with data bases: I also think the line may be disappearing between programmer and systems analyst."

Health Care Plan Comprises DP Labs

WASHINGTON, D.C. – A program to develop and support the application of computer technology to health care has been undertaken by the Bureau of Health Manpower Education, a component of the Department of Health, Education & Welfare's National Institutes of Health.

The program is authorized by the Comprehensive Health Manpower Training Act of 1971 and will support planning and development of a small number of "free-standing or university-based computer laboratories."

These would establish computer-based systems enabling physicians and other health personnel to utilize computer technology in providing health services and in processing related biomedical information. The laboratories would develop compatible languages, standard terminologies, communication networks and decision-making strategies.

Editorial

Height Equals Security

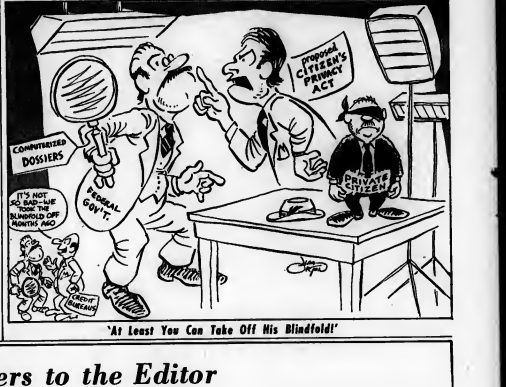
Tropical storm Agnes, primarily remembered for the deaths and general destruction it caused, also may be remembered as the worst DP disaster in history.

It's still too soon to know how long it's going to take some sites to get back on the air or even how long it took to find backup sites undamaged by the storm.

But one lesson has been learned the hard way by a large number of users – no DP site should be located on the ground floor or in the basement of a building. Flooding, even if only from a watermain break, is just too much of a hazard.

An alternative is to build on a hilltop, a location which saved many sites, but for most companies, a second or third floor location would seem to be the more feasible answer – even if it means adding to a one-story building.

Since CW staff members will not be able to contact every site caught in the floods, we would be interested in hearing from users what additional lessons have been learned. Such information could help others lessen the effects of floods.



'At Least You Can Take Off His Blindfold!'

Letters to the Editor

Impact of Shift To Virtual Questioned

Since November 1970 Metropolitan Life Insurance Co. has been utilizing an IBM 360/67 under the control of the IBM virtual machine operating software CP-67.

The system operates almost 24 hours a day with four to 30 users. Several DOS virtual machines run production concurrently with many OS, DOS and CMS (Cambridge Monitor System) development machines. The DOS production work was removed from several 360/30s and neither the programs nor the Job Control Language required any changes to be run in the virtual machine environment.

I cannot agree with Stephen Keider's opinion that if a virtual memory operating system were available on an IBM 370, converting to that system would entail problems as serious as those in converting from DOS to OS [CW, May 31].

In addition, the virtual machine environment offers operational flexibility far beyond that of OS. In our virtual machine environment the programs do not run against an unlimited data base, but run against the standard DOS and OS data sets.

Bruce J. Goodman
Divisional Manager
Software, Hardware
and Consultant Services
Electronics Installations
Metropolitan Life
New York, N.Y.

Let's 'Consolidate The DP Societies'

ACM will raise dues and reduce services, due in large part to the reduction in incoming revenues from the JCC. Declining JCC attendance forces consideration of reducing to one show per year. IEEE convention attendance is only 35% of what it was 10 years ago, and dramatic changes in the program concept are being made.

There seems a clear conclusion to be drawn from these straws in the wind. We have too many conventions, too many professional societies, or both.

A well-rounded EDP-type must lay out more than $100 in yearly dues if he is to belong to ACM, IEEE Computer Group, DPMA and their local chapters.

These organizations compete for many of the same speakers at their monthly chapter meetings and periodic national meetings. They also compete for many of the same members, since the cost of being well-rounded is very high.

It seems clear that, whether or not there are too many conventions, there are certainly too many professional societies.

One might wait for ACM to go bankrupt and be acquired from Chapter XI by DPMA, which then might merge into a jointly held subsidiary with IEEE's Computer Group, in classical capitalistic fashion. But it seems far better to avoid such trauma, and push for consolidation before catastrophe strikes.

The members of these groups should insist that discussions regarding consolidation be conducted by the elected heads of the variety of societies concerned with information processing. Perhaps ifips is the right vehicle for a consolidated society, perhaps not. But consolidate we must, one way or another.

Dan M. Bowers
Orchard Park, N.Y.

Allow DP Students To Take CDP Exam

I recently learned that I had passed all sections of the CDP examination given last February. After gaining programming and systems design experience in military service, I am now completing my formal education at California State Polytechnic University, Pomona, majoring in business data processing.

I feel my recent exposure to the course materials in my educational studies is directly responsible for my passing the CDP examination in the first sitting.

Students in DP related areas nearing graduation and those recently graduated should be given an opportunity to take the CDP examination, even though the work experience requirement has not been met. If successful, issuance of the certificate would be contingent on satisfying the work experience requirement.

Lynn E. Franklin, CDP
Riverside, Calif.

Underestimates, Overselling Can Kill Project

By Miles Benson
Special to Computerworld

Some projects fail for subtle reasons.

Sched didn't, though. The reasons it failed were as glaring as its name.

Sched was designed to schedule the computer workload at Company D.

It failed because it was oversold and underestimated.

What is interesting about Sched, then, is not so much that it failed, but that it took as long as it did to fail.

But let's back up a little.

Company D has a great deal of production data processing work, running on several similar large computers. Scheduling of DP jobs, a vital but tricky problem. The more you have, and the more intertwined the systems get, the trickier it becomes. And if you have more than one computer involved, well, manual scheduling becomes a tough task, with many people involved.

The basic idea of using a computer to schedule computers is good. A reliable schedule is based on a consistent algorithm. You get a complex problem solved fairly cleanly and a variety of reports on your job mix as a by-product. And if you do it right, you maximize throughput.

All that made Sched an easy project to sell to Company D management. But it was oversold.

When you sell a project, you make some promises about the good things that will come of it. The promises already stated here should have been enough. But the Sched people made one more.

Commentary

They promised enormous cost savings. They promised a large number of existing scheduling personnel could be displaced or dismissed. They promised the implementation cost and the running cost would be much less than the manual scheduling cost.

It's easy now to look back and say that was wrong. Those cost savings vanished as implementation costs soared. But at the time it may have even been a necessary promise.

Company D had declining sales, declining earnings and a declining work force. It was pretty touchy to sell any new ideas that didn't have cost savings stamped all over them. The Sched people fell into that (perhaps necessary) trap.

What held all the promises together into a believable whole was an estimate of the time for certain Sched milestones. The second major mistake in the Sched project was those estimates. The whole may have seemed believable, but its component estimates were as shaky as Jell-O.

The estimates were put together the right way. Technical people were asked to give their best technical judgment about the tasks to be done.

But then something went wrong. The people selling Sched looked at the estimates, and got nervous. "Those estimates can't be sold," they said to themselves. And so they bent them to fit into a saleable package.

The results were predictable. Sched sold, all right. Company D executives practically salivated at the thought of those cost savings. And then the implementation began.

Missing Deadlines

Sched crashed through estimated milestones like a car on ice with locked brakes. Sched implementors worried about it at first. But after a while, missing deadlines became a way of life. The Sched sellers, caught in their first lie, concocted a revised set of even phonier estimates to keep the project alive.

Sched careened from deadline to deadline, technically making steady progress but administratively blackening its name. The only question was, could Sched get on the air before management would cut it off at the pockets in disgust?

It was a close race. The scheduling algorithm was checked out and working. The input processor and the report generator were both in great shape. But the data base was the hangup. Schedulers threatened with losing their jobs due to Sched really weren't anxious to assist in their own demise by helping Sched people with the job characteristics. And even the technical people had underestimated the job of computerizing this information.

Sched lost the race. The program was working, scheduling up a storm using contrived data. But one additional missed deadline, this time on the data base, was too much for upper management. Success, said the Sched people, was right around the corner. But they had said that before.

Funds for Sched were cut off. The implementation team was broken up. The Sched salesmen were sent to Company D's Siberia. The code and the data base were put in mothballs," "just in case."

But of course "just in case" never came.

Restricts Some Tape Use

Standards Design Can Hurt Initiative

Standards, according to the American National Standards Institute (Ansi) are a good thing – at least when they are written to encourage enterprise and initiative.

The question for data processors, however, is whether or not data processing equipment standards do encourage enterprise and initiative. As Ansi implicitly recognizes, there is a distinct possibility that standards can be used to hold back initiative, and it looks as though that is how standards have been used in data processing in many cases.

The Taylor Report
By
Alan Taylor, CDP

Take, for example, the de facto standard we have for 1,600 byte/in. tape. This tape was introduced seven years ago, but error checking is not needed if our tapes were really error free (as many tape advertisements imply, and as some tape error reporting routines apparently show).

Factually, however the Society of Certified Data Processors (SCDP) tests, and our subsequent talks with many tape manufacturers have failed to find *any* tape which can be expected to perform to specification in an error free way even on the first pass of a new tape at an installation!

Moreover, even if the tapes as delivered to the installation were really error free, this would not mean they could be trusted to continue to operate in an error free mode.

Tapes, unlike disks, come right into contact with the heads. The recording surfaces and the back are often touching various parts of the mechanism and other wraps of the tape itself.

Tapes can be permanently hurt when used on a misaligned drive, or if shipped around the country

Other useful items might give the number of the record – whether it was the first record, the second record, or the 593rd record. In turn this could allow many tape units to be kept moving over data instead of bottlenecking them to the use of only a single drive per data path.

Foot Stones – Not Milestones

Such items as the distance along the tape itself could be handled either in the postamble, or else by a special short block. For instance, if there were "foot stones" that is, markers every foot along the reel, it would be possible to have drives that you would be able to give an instruction to go and find foot number 594, or advance to the next foot mark.

Writing in Place

Footmarkers also could be placed in preambles. This could be useful because it would mean that interchange of tapes with systems that did not have this facility would still be possible.

Format for 1,600 Byte/In. Tape Block

This figure shows the current de facto format of a 1,600 byte/in. tape block. The data itself is surrounded by symetrically arranged 41 character preambles and postambles. Each of these consists of a single all-ones sentinel character next to the data and a 40 character all-zero bit block separating the sentinel character from the unrecorded interrecord gap.

there is still no Ansi standard. The de facto standard – which all users have to conform to or risk being hurt – is that each block of data on the tape is surrounded by 738 bits, arranged as a 41 9-bit – character preamble and 41 9-bit character postamble. In either case the character next to the data is an all-ones sentinel character while the other 40 characters are all zero characters (see illustration).

That does not sound very restrictive or harmful, does it? It does not appear to be holding back progress in the use of 1,600 byte/in. tape, does it?

But it certainly can be. Because while the 18 one-bits are all really used, and are really necessary, less than 25% of the 720 zero bits are being used.

If the standard inhibited the use of the rest of these bits – as the continuation of the current de facto standard has done for the past seven years – then it will restrict enterprise and initiative.

Use of these bits can provide users with many advantages, even while allowing their tapes to be processed on other standard 1,600 byte/in. drives.

Here are some of the possibilities that illustrate this:

The current error checking capabilities, for instance, on these magnetic tape systems could be greatly improved. True, in unknown error-causing environmental conditions.

Tape systems are vulnerable – and the degree of vulnerability differs widely. But error checking capabilities do not – on present formats – offer differing levels of error checking.

In the current sequential nature of tape operations, errors in a tape file do not fade away. They are sort of cumulative poisoning (like lead or strontium 90 poisoning) in the data. Naturally then it would be useful to some people to have the capability of having an improved error checking without losing compatibility.

40 Zeros Block Improvement

This could be done – if the standard did not demand 40 all-zero characters written after each block. We would be able to be put into use a few of the character positions, starting say, five bytes after the end of data had been recognized with the original sentinel. More check data could be added here during writing and checked by normal microprogramming methods during reading. It would give increased quality assurance without losing compatibility with other drives.

Block Numbering

An error check is not the only possibility for the postamble.

Many of these bits are not being used, and could be used to allow enterprising vendors to supply better services to their users, while still providing compatibility. The danger involved, which could hurt this possibility, is that either a de facto standard would continue in force, or an Ansi standard could effectively ban these uses.

The preamble zeros are only partially used for synchronization.

A special short block could be used as a footmarker – so that it would be unnoticed by the system. This, by the way, opens up writing in place – a not inconsiderable idea!

The Job of Standards

To obtain these benefits for the users – without losing the compatibility and capability of being read on other drives – would be certainly an encouraging enterprise and initiative.

To be achieved a tape standard would have to be written defining that the postamble could be constructed with other than all zero bits in those 40 characters. It would have to be written so that drives, in order to comply with the standard, need only the parts of the postamble that they really have to use, and would ignore, or use, what was in the rest of those areas – as their designers had decided.

That would be quite a change in philosophy from the current de facto standards.

User Hopes Could Grow

It could also cause a major change in philosophy from the users point of view. He could expect to start getting real use out of his current tape drives – making them a lot more useful than they are. (Indeed he could expect them to be almost as useful as they were with the Univac File Computer back in 1958!)

If he had a set of eight drives attached to a controller, he could expect to be able to have all eight going at the same time, interrupting the processor only when something important occurred that needed the processor's attention.

His files then could be operated much faster and, with improved error checking, much more accurately.

True, he might not be able to read the same block forwards and backwards too easily – although even this can be done by restricting the track positions on the postamble and preamble.

He would also be able to trust the much higher speed drives that are on their way. An error checking capability that is suitable for a particular speed of drive – say, 120 kbyte, may or may not be suitable for use on a high speed drive of say, one million kbyte. It may still be useful to produce tape that can be read on either. The current standard format does not allow for different levels of checking. This means that the error checking that was found to be suitable at 120 kbyte will be the only one that will be available at one million kbyte! Naturally conservative users may not trust it.

So standards are important – and tricky.

It is all too easy to write standards that hold initiative back, and all the indications are that the present de facto standards in our industry are doing just that.

I wonder some people think we have planned obsolescence of our hardware.

3 Tape Advances That Could Be Stopped If Tape Standards Are Not Flexible

Improved Drives Utilization

Currently, outside rewinding, only one drive per path can be moving over data. With block numbers in the postamble, as many drives as are connected could be moving over data at the same time. This could improve system productivity considerably – often doubling it.

Writing-in-Place Updating

Currently tape records can be changed only by rewriting the whole file – unlike disk records which can be changed by simply rewriting the particular record. Use of "footmarkers" on the tape at known minimum distances apart would allow tape files to be updated in place (the appropriate housekeeping records of the number of updates, etc. would be kept in the postamble.)

Variable Error-Checking

The incidence of errors, and their importance, is affected by many things, including the environment, the condition of the tape and most important of all, the character of the application itself. The format used – which defines the compatibility – is only one factor. By providing for system use of the postamble it would be possible to provide suitable error-checking levels for particular uses while not endangering compatibility.

COMMUNICATIONS

Data Briefs

IBM 2260 Users Cut Costs With Ultronics 7700 CRTs

MT. LAUREL, N.J. – GTE Information Systems has added a display subsystem to the Ultronic Videomaster line to replace the IBM 2448/2260. The system is said to cost 15% to 25% less than the IBM CRT system.

The Videomaster 7700 local cluster system interfaces directly with 360/370 selector or multiplexer channels, providing a maximum data transfer rate of 5,500 char./sec, about twice the capacity of the IBM 2260, a GTE spokesman said.

Up to 24 CRT terminals can be supported in one cluster configuration and 16 displays can be handled by one controller when a 960 char./screen capacity is used, doubling the 2260 which is limited to eight terminals on one 2848, a spokesman said.

A single terminal with controller costs $2,314 with maintenance. In cluster configurations system costs start at about $75/mo, the company said. A 24-terminal system costs $1,776/mo.

First delivery of the 7700 system is scheduled for this summer. Ultronics is at Central Ave. and East Park Drive, 08057.

System Programs 300 Lines

DALLAS – Action Communication Systems Inc. has a modular programmable communications system that includes a Data General Nova minicomputer. The system can support up to 300 lines and terminal devices operating at speeds up to 3,600 bit/sec.

The Telecontroller system can be interfaced to 360/370, Honeywell and Burroughs mainframes and is available as a complete turnkey system.

A typical Telecontroller configuration for 20 lines with 200 terminals operating at speeds up to 3,800 bit/sec costs about $100,000 depending on options, a spokesmen said.

The system is also available on three-to-six-year pay out lease plans. All prices include complete software end maintenance support. The firm is at 10300 N. Central Expressway, 75231.

CRT Displays TTY Set

PENNSAUKEN, N.J. – A CRT terminal that can display the full character set of the Model 37 TTY is available from Video Systems Corp.

Called the Model 5000/BTL, the CRT handles all 128 Ascii characters and provides upper and lower case alphanumerics including the 96 graphic symbols available on the Model 37, the company said.

Data rates from 110 bit/sec to 1,200 bit/sec are switch selectable and 1,296 characters can be displayed. Four pages of data can also be stored in a buffer memory. The CRT is priced at $4,995 from the firm at 7300 N. Crescent Blvd., 08110.

Conditioner Improves Lines

ROCKVILLE, Md. – Hekimian Laboratories, Inc., has introduced the Model 66 Line Conditioner, which conditions the amplitude response and envelope delay of voice frequency telephone circuits used for data.

Units are available with standard 200 Hz equalizar spacing or "proportional spacing" for extended bandwidth.

Priced at $650, the Model 66 is designed for use in leased networks. The unit can be used to improve the level of conditioning supplied by the phone company.

Hekimian is at 322 North Stonestreet Ave., 20850.

Data Interconnections

Rochester Begins NPD Installations

By Ronald A. Frank
Of the CW Staff

ROCHESTER, N.Y. – Rochester Telephone Corp., an independent phone company has begun installing Network Protective Devices (NPD) for users who want to connect their non-carrier data equipment.

First proposed to the New York Public Service Commission (PSC) last year, the NPD is part of the Rochester Telephone interconnection plan. While the PSC has yet to rule on the Rochester plan which combines the NPD with the certification

Rochester Telephone NPDs installed at university include seals to prevent tampering.

of Customer Owned and Maintained (Coam) equipment, Rochester Telephone is providing the interface on a special assemblage (non-tariffed) basis.

One of the first data users to receive the NPD was the computation center at the University of Rochester. About 20 NPDs were installed at the university.

Rochester Telephone normally will supply the NPD on the outside wall of a subscriber's premises in much the same way the local electric company delivers electric service to a residence. For the user this means having a wire pair from the NPD termination to where the Coam equipment will be used.

While Rochester Telephone says it will provide all necessary specifications for this internal cable, the user must install it.

The university computation center did not have this problem since it does not physically own the outside of the building. Therefore, the telephone company installed the NPDs at an inside location in the same way the Bell System installs its DAA. But for future Rochester Telephone users in new buildings or in tall structures, the internal cable will be an extra cost.

When it decided to consider non-carrier data sets, Rochester University found relatively few independent suppliers had data sets that would work with the NPD. "Many of the independent modems rely on the Bell DAA to detect the ring signal, transmit clear to send, and similar functions," according to Mike Armstrong, assistant director for systems at the computation center.

Certification Requested

After contacting several suppliers to replace its 103 modems, the university selected Tuck Electronics Corp. units. It notified Rochester Telephone it intended to purchase the data sets and requested certification. The telephone company asked for schematics on the modem, the Model 1033AP, which were furnished.

Rochester Telephone later asked the user to have a unit available at the computation center. A Rochester Telephone certification engineer came to the center, disconnected a phone company supplied 103 data set and connected the Tuck modem. "They made measurements of the output level from the modem, the return loss from the central office and took some other readings," Armstrong said.

After examining the schematics and performing its tests, the telephone company sent a letter to the computation center notifying the university that the modem had been certified.

It is not definite whether only one sample unit will be tested or whether the Rochester telephone company will test each Coam unit to be installed. In the case of the university, all units were certified based on a test of one data set.

The university is paying Rochester telephone $9.50/mo for each NPD, "several dollars more than a normal business line," Armstrong said. The user was also charged a $20 installation fee for each NPD. Rochester Telephone is apparently using the rates proposed in its tariff, although each special assemblage contract with users allows the company to modify the rate if the tariff is approved by the PSC at a different level.

The Tuck modems cost the university about $320 each. If it allocates $47/mo to a write-off plan, the modems will pay for themselves in only seven months, Armstrong said. The $47 is the current rate for a 103 supplied by the telephone company. On a more conservative write-off of $13/mo, the modems will pay for themselves in just over two years, Armstrong added.

NPD a Precedent?

ROCHESTER, N.Y. – The New York PSC could decide on the Rochester interconnection plen later this summer. Although it is not known how the PSC will rule, the Rochester Telephone date users now being interconnected via the NPD end equipment certification may be the first to participate in an interconnection method that has attracted attention from other independent phone companies.

The NPD could well become the independent telephone company equivelent to the Bell DAA even though AT&T has claimed it offers virtually no protection.

Before the Tuck units were installed, the university had a mixture of Bell 103s, Lynch and Sangamo data sets. Since Rochester is an independent phone company, it cannot get Western Electric data sets exclusively, Armstrong explained.

The university is using the Tuck modems as part of its time-sharing service. The 20 customers on the NPD line are using 110 bit/sec TTYs; IBM 2741 terminals operating at 134.5 bit/sec; and some Datel terminals from UCC and Hazeltine CRTs operating at 300 bit/sec, Armstrong said.

Possible Innovations

Since the user has complete control of the wiring on his side of the NPD, there are possible innovations to assist in the troubleshooting. At Rochester University Armstrong has also connected standard 4-prong phone plugs to each NPD line.

"If we suspect the line, we can simply disconnect the Tuck modem and connect a standard phone via the 4-prong plug. If it is not possible to dial a call on the line, there is a good possibility that the line is bad," Armstrong noted. "More importantly, we then have some information that will be meaningful when we report the trouble to the phone company."

New AT&T Modem, DAA Rates Okayed Pending FCC Study

WASHINGTON, D.C. – The FCC has given a tentative green light to AT&T to initiate new rates on data communications equipment pending further study of the issues. The rates will take effect without approval by the commission.

While AT&T will drop monthly rates on one data set and several data access arrangements (DAAs), many installation charges for the devices will be increased.

The Bell 201 data set will cost $55/mo on interstate AT&T Data Phone service with a $75 charge for installation. AT&T had originally proposed dropping the 201 rate to $47/mo, but it told the FCC "continuing market analysis" indicated the rate should be set higher. The 201 presently costs interstate users $72/mo with a $100 installation charge.

The Bell 202R data set will cost $17/mo with $50 for installation compared with the $15/mo and $25 installation originally proposed.

In the area of DAAs, AT&T will charge users $3.50/mo for a CBT unit with a $20 installation charge, or a $10 jump over the previously proposed rate. The CBS unit will cost $4.75/mo with a $15 installation charge, or a $5 increase over earlier installation rates.

The monthly rates represent a drop of 50 cents on the CBT and $1 on the CBS.

AT&T also will increase the monthly rates for its multichannel data station service which provides for the derivation of 75 bit/sec and 150 bit/sec channels for teletypewriter users. The initial three channels under the service will cost $90/mo with a $100 installation compared with the $72/mo and $100 installation proposed earlier. Additional channels will cost $15/mo with installation increased from $35 to $50.

Although the new rates are scheduled to become effective early this month, the FCC said it will require AT&T to return to its earlier rates if the new charges are not approved.

Modem /Dialer Can Save 60%

PALO ALTO, Calif. – A combination modem and automatic dialer device that may save users as much as 60% compared to AT&T units is available from Vadic Corp.

The modem/dialer replaces Bell 103 or 202 data sets in addition to 801 automatic dialers. The modem/dialer can operate at 300 bit/sec or 1,200 bit/sec with either pulse or Touch-Tone automatic calling capability.

A Vadic 300 bit/sec version with auto dial costs about $23/mo on a three-year lease while a 103 data set with a separate 801 dialer from Bell would cost about $70/mo, according to Vadic.

The modem/dialer unit includes diagnostic indicators to monitor both the dialer interface lines and the EIA modem interface. A plug-in module in the dialer portion of the unit allows the user to convert from pulse to Touch-Tone dialing in the field. The dialer will automatically recognize non-valid data signals such as line noise, busy and dial tones, and rapidly redial the called number, the company said.

The 300 bit/sec version is priced at $700 while the 1,200 bit/sec unit costs $800. Vadic is at 916 Commercial St., 94303.

Honeywell brings you two great new ways to get more net out of a data communications network.

Our new data communications networks control data processing costs by concentrating computer power at one central location. At the same time they allow more people, in remote locations, to enjoy the full use of the central facility. New technology now makes it possible for almost any business, of almost any size, to use a communications network. So almost any company has a bottom-line reason for using a Honeywell communications network: net profit.

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Way two: Set up your own network. You can center your network around Honeywell's new larger-memory Series 6000 computer system with many enhancements.

Front-end network processors, such as the DATANET 355, or new models of the DATANET 305, will then move your data to and from communications lines. Network controllers, such as our new System 700 or our 316/1600 multiplexors/concentrators, might be used to spread the network out, so more of your people can use it more (while you get economies of scale). To interface with your network, Honeywell offers a variety of input/output terminals.

The same network concept can also work with other Honeywell computer systems, such as the Series 2000 and the Series 400.

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Expanded memory capacity – to over four million bytes in larger models.

Bulk Store capability – up to 33 million bytes of auxiliary memory for heavy I/O requirements.

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GCOS Software additions – HEALS (Honeywell's Error Analysis and Logging System), File Supervisor and Time-sharing Debug/Trace and Activity Reporting system.

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The Other Computer Company:

Honeywell

HONEYWELL INFORMATION SYSTEMS (M6081) 200 SMITH STREET, WALTHAM, MASS. 02154

Random Notes

Assembler/Editor Available For Naked Mini, Alpha 16

NEWPORT BEACH, Calif. — A conversational assembler that also provides extensive on-line editing and updating capabilities is available free to users of Computer Automation, Inc., 16-bit Naked Mini and Alpha 16 minicomputers.

Called Omega, the package enables paper tape users to perform both editing and program assembly functions in core memory, eliminating repunching tapes to eliminate all errors prior to final program assembly, according to the firm.

Omega is said to use about 6,000 words of 8K core memory. The program is upward compatible from Computer Automation Model 116, 216 and 816 Able assemblers.

Computer Automation, Inc. is at 895 W. 16th St., 92660.

Project Management, Control System Checks Worker Time

NASHUA, N.H. — Daily information can be provided by the Dataroyal Inc. project management and control system relating to the status of systems and programming projects and time expended by each employee assigned to a project leader.

The package generates a variety of management reports including employee hours report (by project, by project leader), daily project status (by start date), weekly project status, company or department report, billing report and project completion report.

The fully documented system operates on IBM System 360 models 20, 25, 30 and above and system 370 models 135 and above having a minimum core configuration of 16K. It has 16 RPG programs and is offered in disk or tape versions.

The system can be delivered immediately for $1,500. Dataroyal, Inc. is at 235 Mein Dunstable Road, 03060.

Insurance Policies Made Easier

NEW YORK — A service that enables the commercial underwriter to use a time-sharing computer to help simplify the quoting, writing and auditing of workman's compensation insurance policies is available from Tha Service Bureau Corp. (SBC).

Workmen's Compensation Rates is a comprehensive data base just added to SBC's Call/370 Time-Sharing Service containing all the workmen's compensation rates for 44 states.

The Workmen's Compensation Rates files will be updated as new rates are made available and will include the three most recent tables for each state.

Access by Table to Work File

Credit Inquiry Uses Sequential Plan

By F.D. Peterson
Special to Computerworld

ENID, Okla. — When an on-line application requires random retrieval (including updating) from a large disk file, the file organization and access methods generally considered are direct access or indexed sequential. However, at Champlin Petroleum Co. neither method is used in an application requiring on-line interrogation (through IBM 2260 terminals) of credit card accounts from a file containing several hundred thousand accounts stored on eight 2314 disk packs.

The method used is sequential, and access is by reference to tables on a work file created at reorganize time. The application is designed to provide the credit department with the status, up through the previous night, of all the firm's credit card holders.

Features of the system include:

- Display 240 characters of information on any credit card holder in a one-half second response time. Nine terminals are used and screen capacity is 480 characters.
- Inquiry can be made either by credit card number or by alphabetic name.
- Accounts can be located by using last name only and city, or by last name only and first three digits of street address.
- Status changes (cancel, reinstate) can be entered from the 2260 terminal and will update the file immediately.
- Address changes can be entered from the terminal.
- New accounts can be entered from the terminal. The computer will calculate the nine digit account number to be assigned.
- File searches may be made and accounts displayed for those accounts X days past due in the amount of Y dollars.
- Statistics are printed out daily showing counts by type of transactions as well as by terminal.
- Roll-in, roll-out capability allows for a terminal to call in another program for execution a different application. Actual response time to locate a given record for display ranges from 200 to 600 msec (which includes five disk reads). Binary lookups are used; and time to find a record by name is the same if located by number.

In determining the method of file creation and access to be used in the application, three functions were considered: file creation and reorganization, retrieve-only and retrieve-with-update. On a daily basis, the 2260 terminal users at Champlin perform the retrieve-only function approximately 85% to 90% of the time.

Files are updated nightly. The retrieve-with-update function is performed with today's purchases and payments. The file reorganization function is performed nightly on a month-to-date file of new customer accounts (which is a small file compared to the total file). Once each week a fourth of the total file is reorganized (this coincides with cycle billing time).

		Sequential (Work File)	Direct Access	Indexed Sequential
File Creation	Test 1	6.34	24.09	13.45
485 records (or	Test 2	6.32	24.45	13.46
Load or Reorganize)	Test 3	6.27	26.98	13.52
	Test 4	6.27*	21.25*	13.26
Retrieve 30	Test 1	2.01	2.05	5.20
random records	Test 2	2.01	3.02	
	Test 3	2.01	2.19	
	Test 4	1.98*	2.05*	
Retrieve & Update 40	Test 1	5.07	5.10	8.07
random records	Test 2	4.93*	4.85*	8.43

Above times do not include times to Open or Close the files. * not under Power.

Time in Seconds to Executive Same Problem Under Three Different File Access Methods

	Sequential (Work File)	Direct Access	Indexed Sequential
File Creation			
Logic Module	858	1696	812
DTF	144	216	256
Retrieve (with or without Update)			
Logic Module	*	*	4564
DTF	*	296	304

* indicates Module or DTF for this function is the same one used at File Creation time.
Above modules and DTF's are IBM standard for DOS.

Memory (in Bytes) Required for Logic Modules and DTFs

No Significant Change

Tests were made under the three file organization and access methods by function. Timings were made under an operating environment — the on-line application was executing in F1, Power RJE was operating in F2 and the tests were executed in BG. The tests indicated that removing Power spooling, which by its nature requires disk and channel use, did not significantly change the timings obtained.

Equipment involved is an IBM 360/40, under DOS, with eight 2314 disk packs for this one application; four additional 2314 disk packs are also on this same channel for other uses.

In addition to achieving optimum times by function when using the sequential mode for this file, savings in disk space are also achieved. Overflow areas and open slots are not required as may be the case under direct access or indexed sequential.

Also, memory requirements are reduced since logic modules and DTFs for sequential mode are smaller. Installation standards for sorting and extracting or selecting based on multiple conditions can also apply to this on-line file in the same manner as with tape files.

Two of the five disk reads are to obtain tables — the table resident in memory is less than 100 bytes in length. The data for an account is stored on two different packs, one pack containing the static data and one the dynamic data. Although this requires an additional read at inquiry time, it results in using only the dynamic data packs at update time each night.

The program is written in Assembly Language with extensive use of Champlin-developed macros. Fourteen identifiable sub files (including indices) are stored on the eight disk packs. Much of this space is unused — allowance was made at inception time for a doubling of this file.

F.D. Peterson is manager of data processing for Champlin Petroleum.

Aedcap Surcharge Rates Cut

WALTHAM, Mass. — Surcharge rates for the use of Aedcap, Softech's proprietary computerized simulation system for electronic circuits, have been reduced.

Effective with the new rates, the company will charge only for completed analyses performed by the program.

The new rates also reduce the cost of batch processing. For jobs submitted by means of the BATCH command, the surcharge is 60% less than for the same work performed on-line.

Besides the Softech surcharge, the user pays the standard National CSS charges.

Bits & Pieces

Diablo Disk-Based System Offered for Varian 620s

SUNNYVALE, Calif. – A new data storage system for use with the Varian 620 series of minicomputers, uses the Diablo Model 33 disk drive.

The system, developed by System Industries, has a storage capacity of 2.4M words and includes a controller, power supply and interface. It is priced at $12,550.

A second version that uses the Diablo Model 31 has a capacity of 1.2M words costs $10,150 from the firm at 535 Del Rey Ave., 94086.

Data Entry Batch Terminal Uses Comfile Random Access Tape

MINNEAPOLIS – Data 100 has combined a minicomputer with its Comfile magnetic tape random access memory to produce the 88-23 Data Entry Batch Terminal.

Designed to relieve the operator of formatting, information access and data input tasks, the system also provides a real-time method for error correction.

The unit includes a processor with 4K to 8K bytes of memory, 64K storage for data, 8K storage for software, and a typewriter-based I/O unit.

The lease price of the 88-23 is $485/mo on a one year lease; purchase price is $16,400. Delivery is 30 to 60 days from 7725 Washington Ave., South, 55435.

Smaller Pieces

Low-cost noise suppressors for computer printout terminals and electric typewriters such as the IBM 2741, Selectric and similar units can be obtained from Zond Industries, Inc., of San Mateo, Calif. Prices range from $6 to $10, depending upon terminal or typewriter model.

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Priced at $19.95, the Auerbach Guide to IBM Compatible Mamories is designed to aid the evaluation and selection of memories by providing reports and charts that highlight factors to be considered. Auerbach Publishers, Inc. is in Philadelphia.

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Burroughs Corp.'s business forms and supplies group, Rochester, N.Y., has introduced a line of continuous forms binders and racks for data processing forms storage.

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Standard Register, Dayton, Ohio, is offering the Variable Speed Forms Stacker as an option to its Series 1500 Forms Bursters and Bursters-Imprinters at a price of $150.

New Console, Too

Honeywell 6000 Gets Bigger Memories

By Frank Piasta
Of the CW Staff

WALTHAM, Mass. – A series of memory enhancements intended to make the Honeywell Series 6000 one of the most powerful computer systems available has been announced by Honeywell Information Systems.

Memory expansions that double or quadruple the prior limit of the four largest systems and a new bulk memory have been included in the enhancements.

An operator's console similar to that offered with the company's 2000 series of medium-scale systems was also introduced.

The Models 6050 and 6060 can have their memories increased from the former maximum of 256K 36-bit words in two increments of 128K each. The first module can be leased for $9,350/mo or purchased for $407,000. The second module, which raises the systems to their new capacity of 512K words can be leased for $8,250/mo or purchased for $359,000.

The more powerful 6070 and 6080 systems can be equipped with two increments of 128K words and two increments of 256K words. The previous maximum for these systems was 256K.

The first module (128K) of added memory can be leased for $11,000/mo or purchased for $474,000. The second 128K module can be leased for $8,800/mo or purchased for $383,000.

The two 256K modules lease for $17,600/mo or can be purchased for $766,000 each. Addition of all four modules brings the systems to their new capacity of 1,024K (1M) words.

Bulk-Store Memory

The bulk-store subsystem is intended to provide an auxiliary "swapping" memory for all Series 6000 systems.

Designed to improve system performance on I/O bound processors, the memory operates at 1.5 μsec/four 36-bit words.

The bulk-store memory can be increased from 256K to a maximum of 8M words in 31 increments of 256K each. The minimum system can be leased for $7,260/mo or purchased for $233,400.

System Control Center

The new console, called the SC6000 Control Center, is intended to provide interactive message transfer, status display and operator control of any Series 6000 system. It includes a 1,920 character CRT display, status display screen, 30 char./sec serial printer and alphanumeric keyboard.

Intended to replace the normal Series 6000 console, the SC6000 can be leased for $1,650/mo or can be purchased for $65,500.

First deliveries for the memories are scheduled for the third quarter of 1972. The control console will be available in January, 1973.

IBM Terminal Dispenses Cash

WHITE PLAINS, N.Y. – A terminal that reads magnetically striped cards encoded to American Banking Association specifications and dispenses cash in denominations of $5, $10 or $20 is being offered by IBM in models for either indoor or through-the-wall installations.

Designed to be connected to a bank's computer over wide-band leased lines using bisynchronous communications at 2,000 or 2,400 bit/sec, the IBM 2948 terminal uses two keyboards which are revealed only when a proper credit card is inserted.

The through-the-wall unit differs from the indoor model. It is constructed of heavier metal and includes sensors that can be connected to the bank's alarm system as well as to the computer. The computer can also poll the terminal line to determine its status.

The 2948 cash issue terminal is offered on a purchase-only basis for $17,000 for the indoor version. The through-the-wall model costs $18,200. No special software will be provided, IBM said. First shipments will be made during the second quarter of 1973.

IBM 2948 dispenses "greenbacks" under CPU control.

Glossary Explains Disk Jargon

ST. PAUL, Minn. – Disk drive users, especially new ones, will probably find the glossary of disk pack recording terms from the 3M Co. helpful in understanding the associated jargon.

The glossary starts at the basic level by defining access time and dete check, but quickly moves into more exotic areas.

Did you know, for example, that head bleed holes are two vents or ports used to bleed air through the head to control its attitude and attitude?

Head loading, another term that might be bandied about by a disk drive technicien, refers to the action by which spring pressure is applied to a head to bring it into flying position above the disk surface, according to the glossary.

It is often accompanied by an instantaneous hit before flying equilibrium is achieved. A "hit," in turn, is an instentaneous and generally non-destructive contact between the head shoe and a disk, the glossary explains.

The old hand with disks may know that the index point is a point in each pack form which track timing is reckoned. It corresponds with the instant the second double notch in the sector disk passes a sensing device.

But he would have to be very sophisticated indeed before he realized that tunnel erase, in 2311 usage, is the process by which a written track is reduced in width (by about 3.3 mil/side) to eliminate inter-track signal interference.

Copies of the glossary can be obtained from 3M Co., Magnetic Products Division, Marketing Service Dept., Building 224-61, 3M Center, 55101.

Orbit/2 OMR Reader Handles Holes, Marks

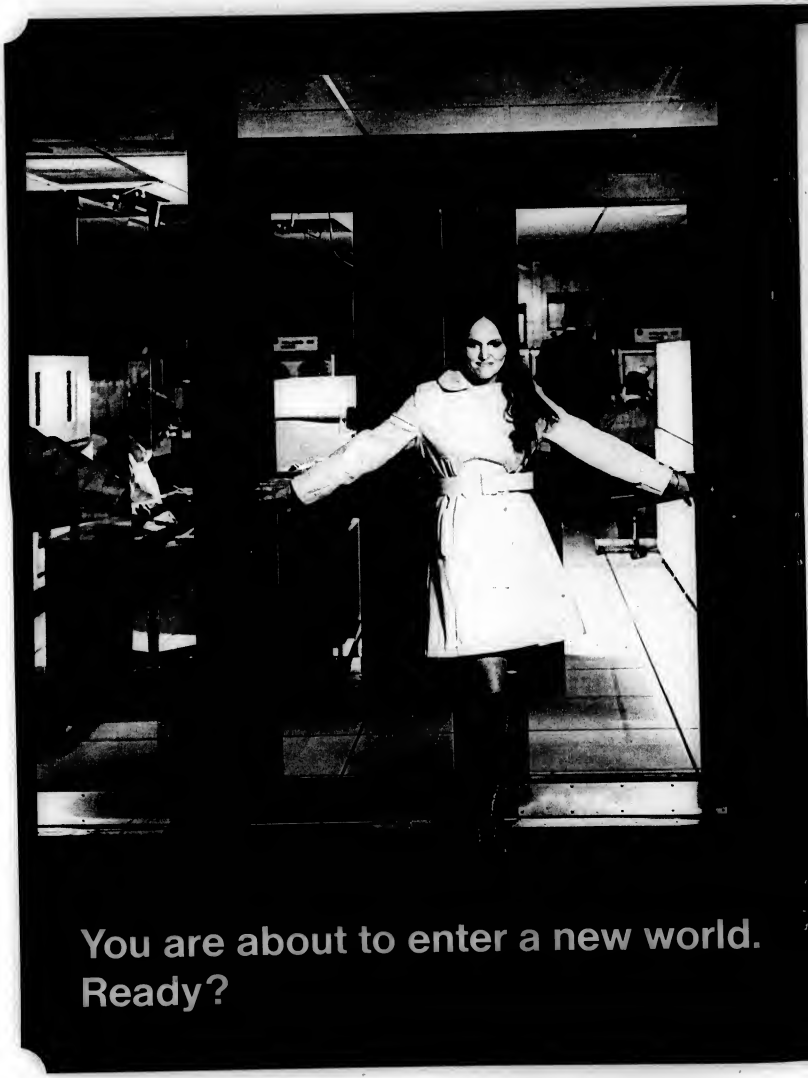
MOORESTOWN, N.J. – A low-cost, manually-fed, optical mark reader terminal from Orbital Systems, Inc. can read either pencil marks or punched holes.

Called the Orbit/2 Source Data Reader, the device can be interfaced to a display terminal for editing, to a modem, or to off-line storage, the company said.

Applications suggested for the unit by the company include test scoring, point-of-sale recording, inventory control and time reporting. It can accommodate documents from 2-1/2 to 14 in. in length and from 2 to 8-1/2 in. in height.

Options include automatic feeding and stacking at 120 document/min, multiple output stackers, and a series of error control, imprinter, buffer, interface, counter and keyboard enhancements.

The Orbit/2 is priced at $1,495 in its basic configuration. First deliveries are currently being made from Church and Fellowship Roads, 08057.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We absolutely refuse to have a failure in Communications

In addition to our regular weekly Communications Section, *Computerworld* will cover Data Communications in a special supplement in the July 26 issue.

Particular interest will be paid to the equipment that makes Data communicate: Modems . . . Multiplexers . . . Front End Processors . . . Communications Terminals . . . Communication Dedicated Minis.

Equipment selection processes will be discussed as well.

Communications is the fastest growing segment of the Computer Industry – 40%-45% growth rates are projected in this area of the industry within the next five years.

Computerworld is read at over 95% of all computer sites using Data Communications. Forty-three percent of *Computerworld*'s readership are involved directly in purchase decisions for Data Communication equipment and services.

If your company manufacturers Data Communications equipment or provides services in this area, you'll want to advertise in this special Communications Supplement Marketplace.

Advertising closing date is July 7.

For more details, rates, or mechanical specifications, call the *Computerworld* representative nearest you, or contact Dottie Travis or Dawn Silva at *Computerworld*. (617) 332-5606.

With On-Line Inventory

Fabric Users Get Fast Answers

By Samuel Gutner
and
Lawrence B. Gutner
Special to Computerworld

NEW YORK – In the fabric business, when a customer calls to ask the current status of his order, it is standard operating procedure to tell him you will call back with the answer.

Here at Fabricland with the help of our small, but comprehensive DP system, the customer gets his answer while he's still on the phone. This capability to respond quickly and accurately is a key element in good customer service, because, often, our client needs that information to reply to an inquiry from his customer, or to plan his own activities based on receipt of the goods from us by a certain date.

We sell fabric ready for cutting, directly to apparel manufacturers and, indirectly, to retailers.

Our quick answers come from a new operations system that, to our knowledge, is a "first" in this industry. We call it Faust – Fabricland Applications Utilizing System 3 and anyone on our five person staff can run it.

Data Base Records

In the computer's data base records are maintained on our complete yarn inventory, greige (knit but not dyed cloth) and finished goods, as well as customer names and addresses.

It carries every customer order in process, with the production status of each piece of goods and its location; contract terms for each order in process; shipping information; and any special instructions.

In short, the data base reflects the very "guts" of the business. It is maintained on interchangeable disk packs.

As a new order comes in, the customer's credit status is checked. Then, one of the principals or any of our secretary/clerks sits down at the computer and enters the order through the keyboard.

The computer automatically applies a number to it, and the complete order is "filed" in the data base. A hard copy is printed out and entered into the daily bookings or contract book.

At this point, one of the principals of the firm decides whether a new mill order is needed to fulfill the incoming customer order. He checks the inventory report which is produced twice a week or on demand.

If the new customer order can be filled from existing inventory, this is done simply by typing the

The Small Systems User

data into the keyboard; if not, a new order is entered.

Either way, the system automatically updates yarn inventory right down to complete color percentages, and the inventory file for the mill where the order is placed. The knit order is printed, including instructions as to where the greige goods are to be shipped for finishing, and sent to the mill.

When we receive notification that the greige goods have been produced and shipped, a clerk/secretary enters the information into the system according to piece number, weight, and color. Again, the computer automatically updates the inventory to reflect this latest fact.

Then, using a program that will produce the finishing order, she enters information specifying the pieces needed to fulfill the contract and the colors they are to be dyed. Again, she gets a hard copy of the finishing order, which is mailed to the finishing plant, and inventory is updated to reflect this action.

Invoice Printed

An invoice is printed by recalling the information entered into the data base at the time the order came in.

Thus, from entry through shipment of a customer order and invoicing of that order, complete with assignment sheet, the system monitors all activity. A number of benefits have resulted, among them:

- At any point in the order cycle, we can go to the computer and check the very latest inventory levels at any or all locations, or the exact status of a given order. We do this while our customer is on the telephone, interrupting whatever work the computer might be doing.
- We know how much raw yarn is at each mill for knitting, with the knitting loss inherent in the production cycle automatically figured in.
- Every night, if need be, we know within three minutes not only what's on the floor at each working location, but what is available to allocate to a new order, and any goods that have been around for a while and should be "moved."

Our prior "pencil" system, which was excellent as far as it could go, often lagged as much as 10 days behind real activities. Now, we know twice a week the information we used to have only twice a year – and then, only after having taken full physical inventory counts.

A bookings report lists all orders in process, showing what has been shipped against each one and what still to be shipped. Though produced weekly, this too can be printed out on demand.

- The computer is a firm taskmaster, forcing all of us to enter operating data on a daily basis. We can't put anything off or treat the slightest detail lightly, because we know that could adversely affect the entire system. Faust is written in a "conversational" programming language.

For example, to enter a new knitting order, the user "calls out" the system's knit order program by typing into the keyboard the command words and codes which identify to the computer the specific program to be run.

The computer then "asks" for specific data on each order, such as: Which mill is to get the order? How many pounds? Where are the resulting greige goods to be shipped? It is impossible to forget any detail, and unless the detail is entered, the system won't process the order.

- Inevitably, there are disagreements with mills and other contractors as to the exact amount of yarn or knit goods they are holding for us. We have found – now that they know we have a computer – that they accept the validity of our figures much more readily.

In the near future, we hope to have knitting and finishing orders punched out on paper tape by the computer, and feed the tape directly into our TWX for transmission to the plants. This will cut several days from the order cycle, and will bypass an extra manual tape preparation step.

S. Gutner is president and L.B. Gutner is vice-president of Fabricland, Inc.

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Computer Industry

a Computerworld news section about the nation's fastest growing industry

July 5, 1972

CI Notes

Russia Denied Computer

WASHINGTON, D.C. – In what may signal a tightening of trade in computer equipment to Eastern Europe countries instead of the expected easing of regulations, the Export Control Office here denied the request of a West German firm to ship a computer to the USSR.

The office would not give details of the system, except to say it was a large, sophisticated computer system which Lorenz EDV wished to ship to an undisclosed customer.

The temporary denial order will be in effect for 80 days at which time it will either be loosened or made permanent.

Burroughs, ICL Hold Talks

DETROIT – Burroughs Corp. last week admitted it was holding talks with ICL and the British Government aimed at acquiring a controlling interest in ICL. Burroughs presently owns less than 2% of the shares of ICL and emphesized the talks were "solely exploratory."

Industry Association Formed

LOS ANGELES – Formation of the Computer Industry Association to provide a "single voice" for the data processing industry was announced last week.

It is a nonprofit trade group which will have offices in Encino, Calif., and Washington, D.C.

Dan McGurk, formerly president of Xerox Data Systems and group vice-president of Xerox Corp., was elected president of the new association.

Data Trends Buys Hypertech Line

PARSIPPANY, N.J. – Data Trends, Inc. has signed an agreement in principle for the acquisition of a product line in the date entry field from Hypertech Corp.

The key product is the Generalized Terminal Unit which consists of a keyboard, two magnetic tape cassettes and a cathode ray screen.

Supershorts

The Data Products Division of Lockheed Electronics Co. has announced discounts of up to 20% on the price of MAC 16 and MAC Jr. minicomputers to colleges, universities and secondary schools.

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The Telex wholly owned subsidiary, Telex Computer Products, Inc., has entered into an agreement to sell $1 million of leased computer peripheral equipment to Manufacturers Lease Plans, inc., Phoenix. The sales will be made as Telex ships equipment to the lessee and the full commitment is expected to be utilized prior to Dec. 31.

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Apaco Corp. has agreed to acquire Cascade Data, Inc. a Grand Rapids, Mich. based manufacturer of computer systems designed for small and medium-sized businesses.

– – –

Sanders Data Systems will open a factory-level repair and parts center in San Francisco this fall as part of an overall expansion of its customer service operations. Similar facilities are planned within the year for the Midwest, East Coast, and southern areas.

The Service Bureau Industry

Sales Rising But Profits Off Pace...

By E. Drake Lundell Jr.
Of the CW Staff

PALO ALTO, Calif. – While revenues are rapidly increasing in the computer services industry, the earnings are not keeping pace with that growth, according to a computer industry research firm here.

Creative Strategies said that by 1976 the annual revenues in the services business should reach $7.5 billion, representing a compound annual growth rate of 29%.

But although industry revenues have expanded at around 25% in the past year, earnings have lagged far behind, the firm said.

For example, operating profit ratios dipped to 2.9% of sale in 1969, the firm said, even though revenues grew by more than 28% that year.

Facilities management is the smallest segment of the services business, the firm said, but it will show the highest growth rate over the next five years, with an annual rate of 53%, for revenues of $1.5 billion by 1976.

Revenues for the other segments of the industry in 1976 will be as follows, the firm said: software, $325 million; data centers, $4 billion; and time-sharing operations, $2 billion.

In business software packages, IBM has outdistanced the field, Creative Strategies said. It presently accounts for nearly half the total revenues from custom and packaged software and is expected to maintain that dominance, the firm said.

In the data center segment of the business the competition is fragmented, the firm added, with 75% of the companies operating only a single center that generates less than $1 million in annual revenues.

The time-sharing segment of the business will be led by firms like GE and Tymshare, Creative Strategies predicted, while firms such as Electronic Data Systems and University Computing Corp. dominate the facilities management segment and are expected to increase their market share by 1976.

The strong competition in the business can be seen by the low survival rate of companies, the firm said, noting there has been a turnover rate of at least 25% each year in active companies.

The services business, Creative Strategies said, is increasingly becoming oriented toward communications with 50% of the computers in use in 1976 having this capability, up from 20% today.

Successful Firm Will Look Like This...

BOSTON – The successful service firm of the future will be able to offer a full-range of customer-oriented services, Frederick Withington of Arthur D. Little told the 35th Management Conference of the Association of Data Processing Service Organizations (Adapso) here recently.

Trends in the four areas of the service business – service bureaus, custom software firms, packaged software companies and facilities management firms – are all leaning toward the full service concept, he said.

The service bureaus, he said, have found they cannot make it by selling raw machine time and they have to offer other customer-oriented services.

The market for custom software, he continued, has not been as profitable as expected, causing these firms to move toward developing packages with wide application.

But at the same time, while there has been some success in the field of packaged software, the marketing costs are high, and therefore many of the firms in the field have been moving toward offering service bureau type services, he added.

The facilities management field is growing, but the really successful firms in this area, he noted, are those offering special services to related industries so that they can use their manpower more effectively.

All of these trends point in one direction, Withington predicted: the establishment of full service firms capable of software development, offering machine time and tailoring their services toward specific industries.

The successful firm of the future, he said, will be in business to solve problems for customers in specific areas of the business where the service firm has a proven expertise.

The successful firm must also be able to tailor its services to specific customers and to offer them personal service. In this area he said many firms would be offering generalized packages that could then be tailored to the specific customer.

Repetitive Processing

Most of the profits for the successful firm, he predicted, would come from repetitive processing of jobs on a meter basis. For example, a firm could develop a package for a customer and instead of selling it outright would perform the processing for the customer charging the customer for each transaction.

In addition, Withington predicted it would not be necessary for service firms to own their own computer equipment in the future.

With the development of computer utilities the service firms – could buy the actual processing time from another firm, he said, and still make a profit by processing customer jobs.

The user, he indicated, does not care how the job is accomplished, as long as it is accomplished effectively and efficiently and meet his needs.

Successful firms, Withington continued, might want to make their own terminal equipment in the future. With the prices of components dropping rapidly, he said service firms could build terminals specifically oriented to the customer's applications and needs.

...But Three Problems Hinder Growth

BOSTON – There are three major problems facing the computer services industry, Bernard Goldstein, Adapso president, told the recent meeting.

The problems involve government regulation, excess time and competition with the major supplier to the industry, he said.

In the area of government regulation, he said the issue was getting equitable treatment from the various boards that regulate the industry to some extent.

The recent Federal Communications Commission decision on the entry of common carriers into the services business, he noted, endorsed the concept of maximum separation between the parent company and a subsidiary in the service business.

On the other hand, he said, the Federal Reserve Board ruled for allowing banks to enter into the business. Its ruling, he said, was "extremely permisive."

These were not isolated incidents, he said, and they showed the need to create a government agency responsive to the computer industry and the need for free enterprise in the services segment of the industry. The agency would not be regulatory in nature, he said, but would rather serve to set consistent government policy and to redress industry grievances.

The industry faces another problem. Many private organizations, like banks and other general businesses, market computer time in competition with the firms that are in the business as their only business.

"Every time a computer is sold there is excess capacity," he said, and this leads to incremental marketing of the excess time.

He emphasized Adapso was not against this practice, but noted it did present a problem to the industry.

Service bureaus could handle fair competition from businesses which marketed time on an incremental basis, but he questioned whether all such competition was fair.

For example, he pointed to the present suit Reynolds and Reynolds has brought against Volkswagen Corp. of America.

Reynolds had offered a service to most of the VW distributors and had 300 customers for the service, he said. Volkswagen later opened its own computer center for its dealers and most of the customers left Reynolds to stay with the parent organization.

Goldstein questioned whether this was fair competition, noting that Reynolds is charging antitrust violations in its suit.

The third problem is competition with suppliers who sell equipment to the service industry at retail, he said.

He said the question was one of who should establish the regulations in this area.

The most notable case, he indicated, was the present Justice Department suit against IBM. He noted that the presiding judge recently said if a consent decree was offered in the case the public would be given 60 days to offer comments before the decree was accepted.

Although this is probably too short a time for comment, the judge indicated it was a step in the right direction, but asked the court to reveal all of the documents in the case so that members of the industry and people interested in the case would be able to comment on the decree

These six people have helped set the stage for an outstanding ACM 72.

With Boston the backdrop.

The stage is set for ACM 72, our Silver Anniversary Conference to be held at the Sheraton Boston August 14-16. These six committee chairmen have helped make sure it will be the most complete program ever presented at an ACM annual conference. With Boston the background for the entire performance!

Besides complete, innovative technical and commercial programs, there will be a number of special events, including the ACM Silver Anniversary evening and awards presentations. Plus cultural, historic and computing tours of the Boston area—and other summertime activities.

Plan to be at ACM 72. If you are not an ACM member, convert part of your admission fee to annual dues and save $25. If you're a data processing executive, send some of your people and urge them to join ACM.

Technical Program Sessions

1 Feature Session:
Current Research in Computer Science.

2 Debates:
The GOTO Controversy and English as a Query Language.

15 Papers/Panel Discussions:
Topics from Advances in Microprogramming to Privacy and Protection in Operating Systems.

18 Paper Sessions:
Topics from Artificial Intelligence to Simulation Tools.

6 Tutorials:
Leading Edge Areas in Artificial Intelligence.
What is a Data Base?
Generation of Automatic Logic Test Data.
Microprogramming and Emulation.
Formal Definition of Programming Languages.
Social Science Computing: Tools for Policy Making and Education.

2 Workshops:
Exploring the Issues in Data Base Technology.
Computer-Aided Graphics in Architecture and Planning.

Commercial Program

2 Panels:
Venture Capital.
Presidents' Panel.

11 Sales-oriented Presentations:
Computer Software—The State of the Art (vendor presentations on the latest in software products).

Photo: from left to right.
Ken Scott, Printing and Mailing.
John Donovan, Technical Program.
Rosemary Shields, Technical Program.
Jack Crowley, Commercial Program.
Jeff DeVeber, Special Events.
Jim Donohue, Local Arrangements.

acm

Association for Computing Machinery

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ST. ALBANS, Vt. – A low-cost microprocessor from Automatic Electronic Systems, Inc., is designed to replace minicomputers in dedicated processing applications.

The AES-80 is a fully programmable unit with a cycle time of 240 nsec, serial transfer rate of 100 kchar/sec and high-speed parallel transfer. Modules of bipolar, MOS, or core can be intermixed in both ROM and RAM components. Up to 4K 12-bit ROM and 4K 8-bit RAM can be attached.

Serial I/O, analog I/O, communications, control and special-purpose modular system units are available for daisy-chaining with the processor.

Software includes a symbolic assembler, cross assembler, minicomputer emulator and systems development routines.

A program development control console with programmer's panel TTY and paper tape reader is available as an option.

The basic processor costs $950. Bipolar ROM costs $350 for 256 words, and bipolar RAM is priced at $255/module.

AES Data Inc., a subsidiary of Automatic Electronic Systems, Inc., Montreal, can be reached through P.O. Box 143, 05478.

Hitachi Plans OCR Unit

SAN FRANCISCO – Next February, Hitachi Ltd. will begin deliveries of its laser-equipped OCR reader that can handle both hand- and machine-printed alphanumeric characters on the same line.

New OEM Products

Intended for OEMs, the device can read up to 2,150 3.7 by 11.8 in. single line sheet/hr. The maximum size sheet, 8.6 by 11.8 in., can accommodate a data line with up to 36 hand-print or 72 machine-print characters. Up to 29 lines can be scanned per sheet. Reading rate for maximum size single line sheets is 1,800/hr.

The character set includes handprint alphanumeric and numeric characters and six symbols. Machine-generated characters in OCR-A, OCR-B, 407 and 12F can also be read.

The laser beam passes through a lens to the paper and reflected beams are received by a photo-multiplier tube. Resultant electrical impulses are then sent to the recognition logic circuitry.

The Hitachi reader is available in both on-line and off-line versions. Prices start at under $20,000 in quantities of 50 or more. Hitachi America, Ltd. is at 100 California St. 94111.

Other New Products

A line of data work stations from Source Automation Co., Princeton Junction, N.J., is designed to provide terminal manufacturers with a low cost modular knock-down desk and electronic enclosure.

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The Superchecker from Micro Switch, Freeport, Ill., can make over 100 functional tests per key or over 6,000 tests per Hall-effect keyboard in a two-minute test cycle.

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Priced at $6.50 in lots of 100, the XR-210 monolithic modem from Exar Integrated Systems, Sunnyvale, Calif., is designed to modulate and demodulate FSK signals.

– – –

A paper tape data preparation device incorporating an electro-mechanical interlocked keyboard and four error-correcting keys, the Kode 77 from Kode, Ltd., Calne, Wilts, England, is available as a keypunch or keypunch verifier.

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The 300 line/min LP 3300 dot matrix printer from Potter Instrument Co., Melville, N.Y., is now available with 9 by 7 and 9 by 9 dot matrices in addition to the 5 by 7 pattern originally offered.

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A Basic program for OEMs with single user minicomputer applications in education, laboratory and business environments has been developed for its Naked Mini 16 and Alpha 16 minis by Computer Automation, Inc., Newport Beach, Calif.

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A range of replacement keyboards for the IBM Selectric from Key Tronics Corp., Spokane, Wash., includes correspondence codes for domestic and foreign applications.

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Lockheed Electronics has announced an advanced power supply for MAC Jr. minis and a No-Panel option for the entire MAC line.

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The Addmaster Model 55 printer from Addmaster Corp., San Gabriel, Calif., offers a print speed of 180 line/min (12 char./line).

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The Model 701 Input/Output Tester from Trexel Corp., Oklahoma City, Okla., is compatible with the IBM I/O Tester (No. 452400) used to check IBM 360/370 systems.

– – –

The CR-300, 300 card/min reader from United Business Communications, Shawnee Mission, Kan., incorporates logic and verification methods that insure accurate reading with up to one-half column data misregistration.

New Registrations

DECISION DATA COMPUTER CORP., 100 Witmer Road, Horsham, Pa., filed to register 350,000 shares of common, issuable pursuant to the company's 1968 Stock Option Plan and the 1972 Employee Qualified Stock Purchase Plan.

COMPUTER HARDWARE CONSULTANTS & SERVICES, INC., 1409 Easton Road, Warrington, Pa., a computer equipment service firm, filed to register 382,860 shares of common. Proceeds, at $9.25 per share maximum, to be used to develop a field service and maintenance organization and for working capital. The underwriter is D.H. Blair Securities Corp., 437 Madison Ave., New York, N.Y. 10022.

HONEYWELL INC., 2701 Fourth Ave. South, Minneapolis, Minn., filed to register 750,000 shares of common at $145 per share.

STANDARD MICROSYSTEMS CORP., 35 Marcus Blvd., Hauppauge, N.Y., large-scale integrated circuit manufacturer, filed to register 300,000 shares of common. Proceeds, at per share maximum, intended for equipment purchases, research and development and working capital. The underwriter is Winkler, Canlor, Pomboy & Co., 485 Madison Ave., New York, N.Y. 10022.

TERMINAL DATA CORP., 16130 Stagg St., Van Nuys, Calif., computer-output microfilm systems manufacturer, filed to register 300,000 shares of common. Proceeds, at $14 per share maximum, to be used for product development and working capital. The underwriter is B.A. Lerner & Co., Inc., 618 S. Spring St., Los Angeles, Calif. 90014.

Acquisitions

Data Disc Inc., manufacturer of computer peripherals, has acquired Bright Industries for cash and stock. Bright Industries, manufacturer of tape drives, will operate as a wholly owned subsidiary.

Computer Complex Inc., a Houston-based time-sharing firm, has agreed to purchase MoSystems Inc.'s subsidiary, Communications Logic, Inc., manufacturer of communications products.

Allied Management & Systems Corp. has acquired C.A.M.D. Systems, Inc. (Computer Aided Medical Diagnostics) for cash and stock.

Metridata Computing Inc. has acquired the customer base and software of the Chicago Tabulating Service Inc. and its subsidiary, Bankers Data Corp. Metridata, a service firm, has an option to purchase certain assets of Chicago Tabulating.

Data Documents, Inc., Omaha, Neb., has acquired Bussman Press Inc., manufacturer of business forms.

Officials Agree

Univac Lifts Sperry Above Expectations

NEW YORK – Boosted by a strong showing from the Univac Division, Sperry Rand Corp.'s operating results for the first two months of the fiscal year are ahead of last year, New York security analysts were told recently.

In addition, J. Paul Lyet, Sperry president, said the results were ahead of the firm's own projections for the period.

When the results for June are in, he said, the firm expects to show first quarter results exceeding those registered last year.

5-Month Figures

In the first five months of calendar 1972 the bookings for the Univac Division were more than 25% ahead of the orders booked in the same five month period a year ago, Robert E. McDonald, executive vice-president of Sperry, told the group of analysts.

It is generally recognized, he added, that U.S. orders for new computer systems ran at a low level last year, but the added business has improved, particularly in the U.S., and said Univac should benefit from that improvement.

Univac, he said, is "quite satisfied" with the progress made with the RCA computer base acquired at the beginning of the year, adding, "It is our general feeling that the customers are pleased with Univac's response to their needs."

At the meeting, Lyet noted the firm planned to make heavier investments in research and development this year than it made last year.

Interdata Shipments Up

OCEANPORT, N.J. – Interdata has delivered more than 200 of its Model 70 minicomputers and the firm has installed more than $4 million in user systems, according to the firm's president, Daniel Sinnott.

Speaking to a group of financial analysts, Sinnott said Interdata has a current backlog of $2.1 million for data communications front-end processors.

The initial reception of the firm's new models 50 and 55 has been "beyond what was expected," Sinnott said, adding that about six of the Model 50s have already been shipped, and first deliveries of the Model 55 are expected soon.

Interdata has a UK subsidiary with 20 employees and a German subsidiary is also in operation, Sinnott said. In addition, the firm has installed more than 60 systems in Japan, he added.

Industrial Control Area

The main marketing areas for Interdata include industrial control, data communications, laboratory instrumentation and OEM systems, Sinnott said. About 40% of the installed Interdata systems are in the industrial control area with both OEM and end-user systems, he said.

In the data communications area, Sinnott predicted the present 20% of the firm's total business will grow to 50% as users realize the importance of front-end processors.

Among the varied application areas for the firm's minis are the control of a "robot arm" system at UCLA, a terrain simulator at McDonnell Douglas, a management information system for banking and the testing of carburetor data at Ford Motor Co., Sinnott said.

Nickels & Dimes

It worked once, so Rockwood Computer is offering another "special" on conversion of its 7% senior debentures. Between April 17 and May 16, $7.1 million principal amount of debentures were converted into 1.1 million shares of common stock. From June 15 through July 14, the conversion price will be lowered to $6.67 from the current $50.43. The number of shares per $1,000 debenture will be raised from 19 to 150 however. The amount of debentures outstanding is now $13.8 million. If Rockwood retires $1.6 million more of debentures, the remaining debentures will convert to unsecured obligations of the firm.

$$$

Dymo Industries and Datascan have set the final exchange rate of seven Dymo common shares for each 10 shares of Datascan outstanding on the effective merger date of Datascan with a Dymo subsidiary.

$$$

International Peripherals and Computer Corp., Santa Ana, Calif. has entered into finance and marketing agreements with Computer Investors Group, Inc. Under the terms of the agreements, CIG received subordinated notes and IPC common warrants for a loan to IPC; and CIG will market and provide lease financing for IPC's products. IPC makes a microprogrammable control unit for peripherals.

$$$

Rapidata, Inc. has declared a 2-for-1 split of the company's common stock to shareholders of record as of June 27, 1972. There were 934,557 shares of common stock outstanding and after the stock split there will be approximately 1.9 million shares outstanding. The firm also declared its first annual cash dividend of 3 cents per share.

$$$

Applied Data Research, Inc. has scheduled its annual meeting for July 29 at 10 a.m. at the Nassau Inn in Princeton, N.J.

$$$

Storage Technology Corp. has received commitments from two banks, The First National Bank of Chicago and Irving Trust Co., New York, to participate to the extent of $10 million in the company's credit agreement with First National City Bank, New York, as agent. These new commitments will increase the total credit from $20 million to $30 million. To date, approximately $15.6 million have been borrowed under the credit agreement.

Earnings Fall Behind Revenues At Cybermatics

NEW YORK – Although revenues set records for the fiscal year ended March 31, earnings were not able to keep pace at Cybermatics Inc. here.

Sales were $5.8 million, up from $5.4 million in the year-ago period, but income fell from $360,697 last year, or 42 cents per share, to $200,702, equal to 20 cents per share, in the year just ended. All of the figures for 1971 are restated to reflect the purchase of Trade Mark Service Corp.

MOVING?

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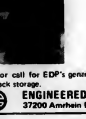
COMPUTERWORLD, 797 WASHINGTON ST., NEWTON, MASS. 02160



TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass 02138

CLOSING PRICES THURSDAY, JUNE 29, 1972

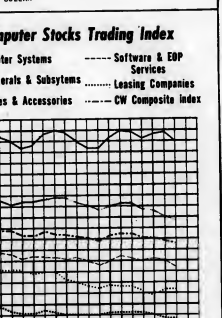
EXCH		1972 RANGE (1)	CLOSE JUN 29 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 1/4	- 1/8	-8.0
A	APPLIED DATA RES.	4- 7	6 1/4	0	0.0
O	APPLIED LOGIC	1- 4	2 5/8	- 1/8	-4.3
N	AUTOMATIC DATA PROC	72- 89	89	+1 3/4	+1.9
O	AUTOMATIC INFO SYST	1- 2	1 3/8	+ 1/8	+10.0
O	BRANDON APPLIED SYST	8- 14	9 1/2	- 1/4	-2.5
O	COMPUTER DIMENSIONS	8- 14	9 1/2	0	0.0
O	COMPUTER DYNAMICS	1- 4	1 3/4		
O	COMPUTER NETWORK	4- 7	4 3/4	- 1/4	-5.0
O	COMPUTER SCIENCES	6- 10	6 3/8	- 1/8	-1.8
N	COMPUTER TECHNOLOGY	8- 8	5 1/2	0	0.0
O	COMPUTER USAGE	9- 14	8 1/2	- 3/4	-7.3
O	COMP AUTOMOT REPORTS	5- 8	5 1/4	- 1/4	-4.5
O	COMPUTING & SOFTWARE	17- 28	17 3/8	-1 5/8	-8.5
O	COMRESS	1- 3	1 3/4	0	0.0
O	COMSHARE	5- 10	7 1/8	- 1/4	-3.3
N	DATA 100	9- 9	6	- 3/4	+14.2
*	EDP RESOURCES	5- 8	5 1/2	0	0.0
A	ELECT COMP PROG	4- 6	5	0	0.0
N	ELECTRONIC DATA SYS.	43- 65	58 1/2	-1 5/8	-2.2
O	INFORMATICS	8- 11	9 1/2	0	0.0
O	I.C.P.A. DATA CORP	1- 5	2 5/8	- 5/8	-12.5
A	ITEL	8- 12	7 7/8	- 1/8	-1.5
O	KEANE ASSOCIATES	4- 7	4 1/4	0	0.0
O	KEYDATA CORP	7- 15	12 5/8	-1 1/4	-4.8
O	LOGICON	4- 8	6 7/8	- 1/4	-3.5
A	MANAGEMENT DATA	8- 10	7	- 5/8	-8.2
O	NATIONAL CSS INC	8- 25	19 1/2	- 4 1/4	-17.8
P	ON LINE SYSTEMS INC	8- 20	18 1/4	-1 1/2	-7.5
N	PLANNING RESEARCH	11- 17	11	-1 1/2	-12.0
O	PROGRAMMING METHODS	24- 30	30 3/8	+ 5/8	+2.1
O	PROGRAMMING A SYS	1- 2	1	0	0.0
O	SCIENTIFIC COMPUTERS	4- 5	4 5/8	0	0.0
O	SIMPLICITY COMPUTER	1- 5	3 3/4	0	0.0
O	SRS COMPUTER SYSTEMS	5- 8	5 3/4	0	0.0
*	TRACOR COMPUTING	2- 3	1 3/4	- 1/8	-6.6
O	TYMSHARE INC	7- 10	8 1/4	- 5/8	-7.0
O	UNITED DATA CENTER	5- 7	5	- 1/4	-4.8
N	UNIVERSITY COMPUTING	14- 26	18 1/4	-2 1/4	-10.9
A	URS SYSTEMS	6- 10	8	- 5/8	-7.2
O	VORTEX CORP	1- 2	1 1/4	- 1/8	+10.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	34- 44	42	-1	-2.3
O	ADVANCED MEMORY SYS	12- 23	19 3/4	+ 3/4	+3.9
N	AMPEX CORP	7- 15	7 7/8	+ 3/4	+10.5
O	ANDERSON JACOBSON	5- 8	6 1/4	- 1/8	-1.9
O	ATLANTIC TECHNOLOGY	1- 11	3 1/4	+ 1/2	+18.1
A	GOLDEN HAWK & NEW	15- 20	18 3/4	+ 3/4	+22.4
N	BUNKER-RAMO	9- 14	11 5/8	- 1/4	-2.1
A	CALCOMP	17- 25	18 1/8	- 1/2	-2.6
O	CENTRONICS DATA COMP	13- 15	14 7/8	+ 1/2	+3.0
O	COGNITRONICS	3- 5	3 3/4	+ 3/8	+11.1
O	COMPUTER COMMUN.	2- 7	2 1/2	- 1/8	-4.7
A	COMPUTER EQUIPMENT	3- 5	3	- 1/8	-4.0
O	COMPUTER MACHINERY	7- 13	11 1/4	0	0.0
O	COMPUTEST	5- 9	5	0	0.0
A	DATA PRODUCTS CORP	5- 7	4 3/4	+ 1/8	+2.7
O	DATA RECOGNITION	3- 5	2 3/4	0	0.0
O	DATA TECHNOLOGY	3- 5	3 3/4	+ 7/8	+30.4
O	DI/AN CONTROLS	0- 8	5	- 1/4	-4.7
O	DIGITRONICS	2- 4	2 1/4	0	0.0
N	ELECTRONIC M & M	3- 5	3	- 3/8	-11.1
O	FABRI-TEK	2- 5	3 3/8	+ 1/8	+3.8
O	GENERAL COMPUTER SYS	7- 18	13 1/2	-1 1/2	-11.5
N	GENERAL ELECTRIC	59- 70	65 3/4	-1 1/4	-1.9
N	HAZELTINE CORP	9- 13	9 3/4	- 1/4	-2.5
O	INFOREX INC	28- 43	44	+3	+7.3
O	INFORMATION DISPLAYS	2- 5	3 1/4	- 1/8	-3.2
A	LUNOY ELECTRONICS	10- 14	10 3/4	- 3/8	-3.5
O	MANAGEMENT ASSIST	1- 2	2	0	0.0
N	MEMOREX	25- 38	25 5/8	-2 1/8	-7.6
A	MILGO ELECTRONICS	17- 44	39 1/2	- 7/8	-2.1
N	MOHAWK DATA SCI	20- 27	19 1/8	- 3/8	-1.9
O	OPTICAL SCANNING	7- 16	9 1/2	-1	-9.5
O	PERTEC CORP	9- 17		- 3/4	-7.6
O	PHOTON	7- 15	13 3/4	+ 3/4	+5.8
A	POTTER INSTRUMENT	13- 21	12 5/8	-1 1/8	-8.1
O	PRECISION INST.	7- 13	8 1/2	- 1/4	-2.8
O	RECOGNITION EQUIP	8- 15	7 7/8	- 1/8	-1.6
N	SANDERS ASSOCIATES	14- 21	14 1/4	-1 1/8	-7.3
O	SCAN DATA	2- 3	2 3/8	0	0.0
O	STORAGE TECHNOLOGY	17- 39	34 3/4	- 3	-7.9
O	SYCOR INC	7- 11	8 3/4	-1 1/4	-12.5
O	TALLY CORP.	8- 17	12 1/2	-1 1/2	-10.5
N	TEKTRONIX INC	34- 57	55 7/8	+2 3/8	+4.4
N	TELEX	9- 15	9 1/8	- 3/8	-3.9
O	WILTEK INC	10- 26	19	-1	-5.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	6- 9	6 1/2	- 1/4	-3.7
A	BARRY WRIGHT	9- 13	9 3/4	0	0.0
A	DATA DOCUMENTS	12- 26	19 7/8	-1	-4.7
O	DUPLEX PRODUCTS INC	9- 16	15 1/2	- 1/2	-3.1
N	ENNIS BUS. FORMS	7- 10	8 3/8	+ 3/8	+4.2
O	GRAHAM MAGNETICS	15- 27	17 1/2	- 5/8	-3.4
O	GRAPHIC CONTROLS	12- 15	12 3/4	- 1/4	-1.9
N	3M COMPANY	78-158	76 5/8	-3 5/8	-4.5
O	MOORE BUS. FORMS	42- 55	54	+ 1/2	+0.9
N	NASHUA CORP	48- 56	52	+1 7/8	+3.4
O	REYNOLDS & REYNOLD	37- 77	38	+ 1/2	+1.2
O	STANDARD REGISTER	15- 20	15 1/8	- 1/8	-0.8
O	TAG PRODUCTS CO	14- 17	14 1/4	- 1/2	+5.6

EXCH		1972 RANGE (1)	CLOSE JUN 29 1972	WEEK NET CHNGE	WEEK PCT CHNGE
N	UARCO	25- 28	25	+ 1/8	+0.5
A	WASASH MAGNETICS	8- 11	9 1/4	- 1/4	-2.8
N	WALLACE BUS FORMS	22- 26	22 3/4	- 3/4	-3.2
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	147-198	182 3/8	-8	-4.2
N	COLLINS RADIO	14- 20	14 1/8	- 3/4	-5.7
N	CONTROL DATA CORP	43- 76	73	-2 1/8	-2.8
O	DATA GENERAL CORP	56- 89	90	-1 1/2	-1.6
O	DIGITAL COMP CONTROL	10- 25	12 1/2	+ 1/4	+2.0
N	DIGITAL EQUIPMENT	72- 97	76 7/8	-4 3/8	-5.7
N	ELECTRONIC ASSOC.	8- 13	10 3/4	- 3/8	-3.5
A	ELECTRONIC ENGINEER.	8- 14	8	0	0.0
N	FOXBORO	34- 41	36 1/2	-1 1/2	-3.9
O	GENERAL AUTOMATION	15- 28	28	+1	+3.7
O	GRI COMPUTER CORP	3- 5	4 3/4	- 1/4	-5.0
N	HEWLETT-PACKARD CO	46- 72	68 1/2	-3 1/4	-4.5
N	HONEYWELL INC	150-158	148 1/2	-5 3/8	-3.4
N	IBM	353-404	391 1/2	-4 1/4	-1.0
O	INTEGRATA INC	8- 16	11	+ 1/4	+2.3
N	MICRODATA CORP	5- 10	7 1/2	-1 1/2	-16.6
N	NCR	28- 35	31 1/8	-2 1/8	-6.3
N	RAYTHEON CO	36- 47	37	- 1/2	-1.3
N	SPERRY RAND	30- 44	41 3/8	-2 1/2	-5.6
A	SYSTEMS ENG. LABS	11- 16	12 1/8	- 5/8	-4.9
A	VARIAN ASSOCIATES	11- 16	14	0	0.0
N	VICTOR COMPTOMETER	15- 24	19 5/8	- 3/4	-3.6
N	WANG LABS.	35- 60	57 1/2	0	0.0
N	XEROX CORP	121-159	149 1/4	-2 1/2	-1.6
		LEA .121-159	151 3/4	-1 1/4	-0.8
A	GOOTHE COMPUTER	7- 18	7	0	0.0
O	GRESSMANN CORP.	2- 5	2 1/8	0	0.0
O	HOMELSCO INC	3- 15	14 3/4	+2 1/2	+20.4
O	COMPUTER EXCHANGE	2- 5	1 3/4	- 1/8	-6.6
A	COMPUTER INVSTRS GRP	8- 14	10 3/8	-1 3/8	-11.7
N	OPP INC INC	8- 13	8 1/4	0	0.0
M	OATRONIC RENTAL	3- 4	2 7/8	+ 1/8	+4.5
A	OCL INC	5- 10	8 1/4	+ 1/2	+8.6
A	DEARBORN-STORM	18- 26	19 1/2	- 7/8	-4.2
A	OPA, INC.	8- 8	7 7/8	- 1/8	-2.0
A	GRANITE MGT	7- 11	7 5/8	0	0.0
N	GREYHOUND COMPUTER	7- 11	7	- 1/4	-3.4
N	LEASCO CORP	18- 24	18 3/8	- 7/8	-4.5
O	LEASPAC CORP	9- 15	9 1/8	0	0.0
O	LECTRO MGT INC	2- 4	1 1/2	0	0.0
O	MDC INDUSTRIES	7- 11	7 1/2	- 1/8	-1.6
A	ROCKWOOD COMPUTER	3- 7	3 5/8	- 1/4	-6.8
N	SYSTEMS CAPITAL	16- 25	15 3/4	-2 1/4	+8.6
N	U.S. LEASING	19- 33	28 7/8	+1 7/8	+6.9

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index

Computer Systems — Software & EDP Services
Peripherals & Subsystems — Leasing Companies
Supplies & Accessories — CW Composite Index



Earnings Reports

COMPUTER AUTOMATION
Three Months Ended April 2

	1972	1971
Shr Ernd	$.12	$.02
Revenue	1,227,002	$14,341
Tax Cred	76,000	5,000
Earnings	162,627	16,796
9 Mo Shr	.26	.01
Revenue	2,936,413	1,593,190
Tax Cred	151,000	1,500
Earnings	316,270	5,569

SYSTEM DEVELOPMENT
Nine Months Ended March 26

	1972	1971
Shr Ernd	$.26	$.20
Revenue	34,301,000	34,135,000
Earnings	657,000	657,000

PROGRAMMING METHODS
Three Months Ended March 31

	1972	1971
Shr Ernd	$.25	$.19
Revenue	3,718,300	2,416,439
Earnings	225,131	168,672

AOORESSOGRAPH-MULTIGRAPH
Three Months Ended April 30

	1972	1971
Shr Ernd	$.74	$.46
Revenue	119,400,000	110,100,000
Earnings	6,000,000	a3,700,000
9 Mo Shr	1.30	.71
Revenue	315[b]00,000	304,600,000
Earnings	10,500,000	a5,700,000

a-After an inventory writeoff of $1,600,000 or 20 cents a share.

CORPORATION 6
Three Months Ended April 30

	1972	a1971
Revenue	$1,280,000	$892,000
Loss	602,000	963,000
6 Mo Rev	837,000	608,000
Loss	1,176,000	1,864,000

a-Restated.

COGNITRONICS
Three Months Ended March 31

	1972	1971
Revenue	$555,314	$788,665
Loss	173,615	124,000

SEISMIC COUPTING
Three Months Ended March 31

	1972	1971
Shr Ernd	$.16	$.11
Revenue	6,694,000	5,321,000
aSpec Cred	7,000	11,000
Earnings	201,000	124,000
6 Mo Shr	.26	.16
Revenue	10,492,000	9,604,000
aSpec Cred	19,000	20,000
Earnings	321,000	162,000

a-From sale of debentures.

COMPUTER INVESTORS
Year Ended March 31

	1972	1971
Shr Ernd	$1.03	$.66
Revenue	13,594,000	10,063,000
aSpec Cred	29,000	b96,000
Earnings	2,132,000	1,362,000

a-Gain on repurchase of a portion of company's debentures at less than principal amount. b-Includes provision for loss on investment and advances of $120,000 or 5 cents a share.

SANDERS ASSOCIATES
Three Months Ended April 28

	1972	a1971
Shr Ernd	$.13	...
Revenue	40,536,000	37,786,000
Tax Cred	150,000	...
Earnings	572,000	(997,000)
9 Mo Shr	.35	...
Revenue	106,695,000	115,972,000
Tax Cred	367,000	...
Earnings	1,591,000	(622,000)

a-Restated.

The Hazeltine 2000 CRT Terminal System, Price/Performance Leader in its class...

...part of the

State of Illinois Computerized Trauma Network

a real-time emergency medical system... linking trauma centers at forty designated hospitals throughout Illinois to the computerized Trauma Registry at the University of Illinois Medical Center in Chicago... facilitating the dispatching of accident victims to the hospital with the particular emergency facilities required... providing complete patient files, survival reports, clinical reports, cost analyses and epidemiological surveys... first network of its kind in the nation, a medical system of the future working today!

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